MOSTEK®

MATRIX DEVELOPMENT SYSTEMS

Operations Manual

MATRIX™ 80/SDT SINGLE DISC MICROCOMPUTER SYSTEM

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MATRIX 8Ø/SDT

Operations Manual

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PUBLICATION NO. 79899

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SECTION 1

GENERAL INFORMATION

1.1 INTRODUCTION

The Mostek MATRIX-80/SDT (Figure 1-1) is a single-floppy-disk-drive-based microcomputer system. The standard MATRIX-80/SDT system includes:

MATRIX-80/SDT enclosure with power supply, fan, MDX six slot card cage, power cord, fuse, eight-inch floppy-disk-drive, MDX-CPU1, MDX-DRAM16, MDX-DRAM32A, MDX-FLP, MDX-EPROM/UART, MDX-PIO, and FLP-80DOS system software package.

The 64K version includes the same items except the MDX-DRAM16 is replaced by another MDX-DRAM32A.

This configuration provides the user with a complete Z80-based Micro Computer System with 48K bytes of RAM (for MK78197), or 64K bytes of RAM (for MK78206), 4K bytes of PROM firmware, 250K bytes of floppy-disk memory, one serial interface and four eight-bit parallel input/output interfaces. MK78210 is a 50Hz version of the MK78206.

The 48K version (MK78197) can be upgraded to a 64K version (MK78206) by using the upgrade kit (MK77982).

With this configuration, the MATRIX-80/SDT may be connected to a standard RS-232 or 20mA for either Z80 software development or any application requiring this type of microcomputer configuration.

The following software is supplied with the MATRIX-80/SDT:

PROM containing the DISK CONTROLLER FIRMWARE (DCF) and the DDT-80 debug package. This firmware is installed in the PROM sockets on the MDX-CPU1.

FLP-80DOS/MDX System diskette containing the System Monitor, File Manager, Input Output Control System (IOCS), modules for reconfiguration and generation of the system and driver routines for the terminal device and printer.

Also supplied on the system diskette is the Mostek Peripheral Interchange Program (PIP), the Mostek Editor (EDIT), the Mostek Z8Ø Assembler (ASM), the Mostek Z8Ø MACRO Assembler (MACRO-8Ø) and the Mostek Relocatable Module Linker (LINK).

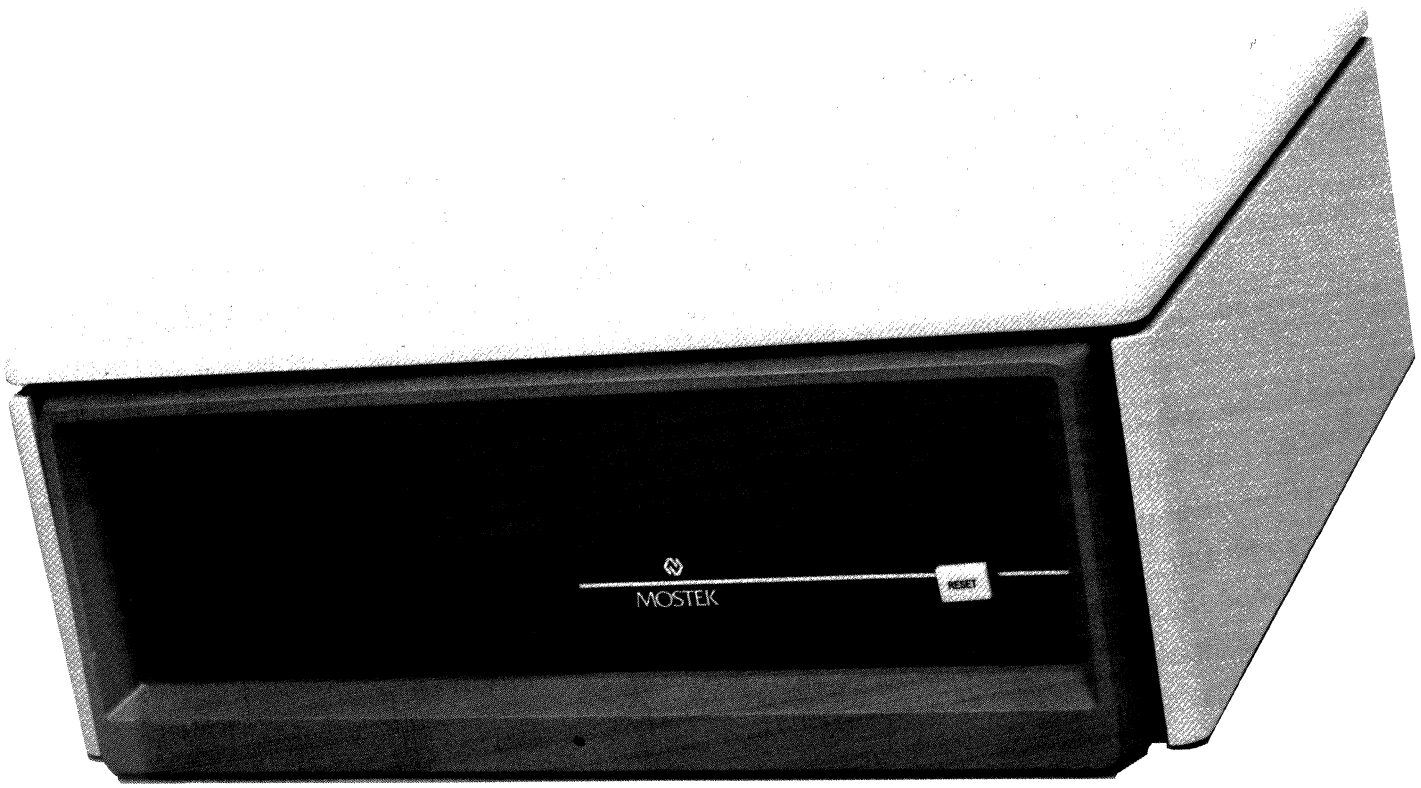
For further information on FLP-8ØDOS operations and commands, refer to the FLP-8ØDOS Operations Manual.

Optional software packages which are compatible with the MATRIX-8Ø/SDT but not supplied include:

Mostek ANSI BASIC
Mostek MACRO-7Ø (Cross assembler for Mostek 387Ø or F8 Microprocessor families)
Mostek FORTRAN
PBASIC
MEDEX-8Ø

All Mostek software is available through a licensing agreement to those users who wish to sell Mostek software as part of their own system. All Mostek software is copyrighted and unauthorized copying is prohibited.

FIGURE 1-1 MATRIX 8Ø/SDT SYSTEM



1.2 SYSTEM DOCUMENTATION

A complete set of system documentation is supplied with the MATRIX-80/SDT. This includes the following documents:

MK79899 MATRIX-80/SDT Operation Manual.
MK79612 MDX-CPU1 Operation Manual.
MK79624 MDX-DRAM Operation Manual.
MK79639 MDX-FLP Operation Manual.
MK79604 MDX-EPROM/UART Operation Manual.
MK79606 MDX-PIO Operation Manual.
MK79668 FLP-80 DOS/MDX Operation Manual.
MK78557 FLP-80 DOS Operation Manual.
MK78515 Z80 Programming Manual.
MK79635 MACRO-80 Operation Manual.

This is the MATRIX-80/SDT Operation Manual and it gives a general introduction, unpacking instructions, preliminary tests, system power up, system integrity check, flexible disk handling instructions, operation examples, maintenance and trouble shooting procedures. Appendix A supplies the schematic diagrams and wire lists for the system wiring, cabling and power supply. Appendix B details the preventive maintenance procedures. Appendix C details the mechanical and electrical specifications for the system. Appendix D provides interfacing information to standard terminal and printer equipment.

1.2.1 DEFINITION OF SYMBOLS USED IN THIS MANUAL

The following symbol conventions are used throughout this manual:

1. <CR> Indicates CARRIAGE RETURN.

2. _ Underline, All user entered text is underlined.

3. A All Capitalized characters in a command are entered exactly as shown.

1.3 HARDWARE DESCRIPTION

The MATRIX-80/SDT system is based on the MDX family of Microcomputer modules. The six modules used are described below:

1. MDX-CPU1. This circuit board contains the MK3880 Z80 CPU, and an MK3882 Counter Timer Circuit (CTC). Also included are two MK2716 EPROM devices which contain the system firmware, and a 35392 RAM which contains 256 bytes used as a scratch pad in the 48K version only.

2. MDX-DRAM32A. This circuit board contains 32K Bytes of Mostek MK4116 dynamic RAM.

3. MDX-DRAM16. This circuit board contains 16k of Mostek MK4116 dynamic RAM (used in the 48K version only). In the 64K version, this board is modified to become a MDX-DRAM32A. (The memory-maps of the 48K and 64K are shown in Figures 1-2 and 1-3 respectively.)

4. MDX-FLP. This circuit board contains the LSI floppy disk controller and a Mostek MK3883 Direct Memory Access (DMA) device. This circuit interfaces to the floppy disk drive. It provides direct transfer of data between the disk drive and system RAM. The floppy disk controller is IBM 3740 compatible.

5. MDX-EPROM/UART. This circuit board provides the RS-232 or 20mA current loop compatible serial interface. The baud rate for the serial interface is generated by an LSI baud rate generator. The BAUD rate is set by a four position DIP switch and may be any standard rate from 50 to 19.2k. This BAUD rate must be initialized to match the terminal before the system is used. Also available on this circuit board are five sockets which can be used for MK2716 EPROM devices. These EPROMS cannot be added on the MATRIX-80/SDT 64K (MK78206).

6. MDX-PIO. This circuit board contains two MK3881 PIO circuits and provides four eight bit parallel Input/Output ports with two lines of handshake control on each port.

FIGURE 1-2 MEMORY MAP OF THE MATRIX-8Ø/SDT 48K

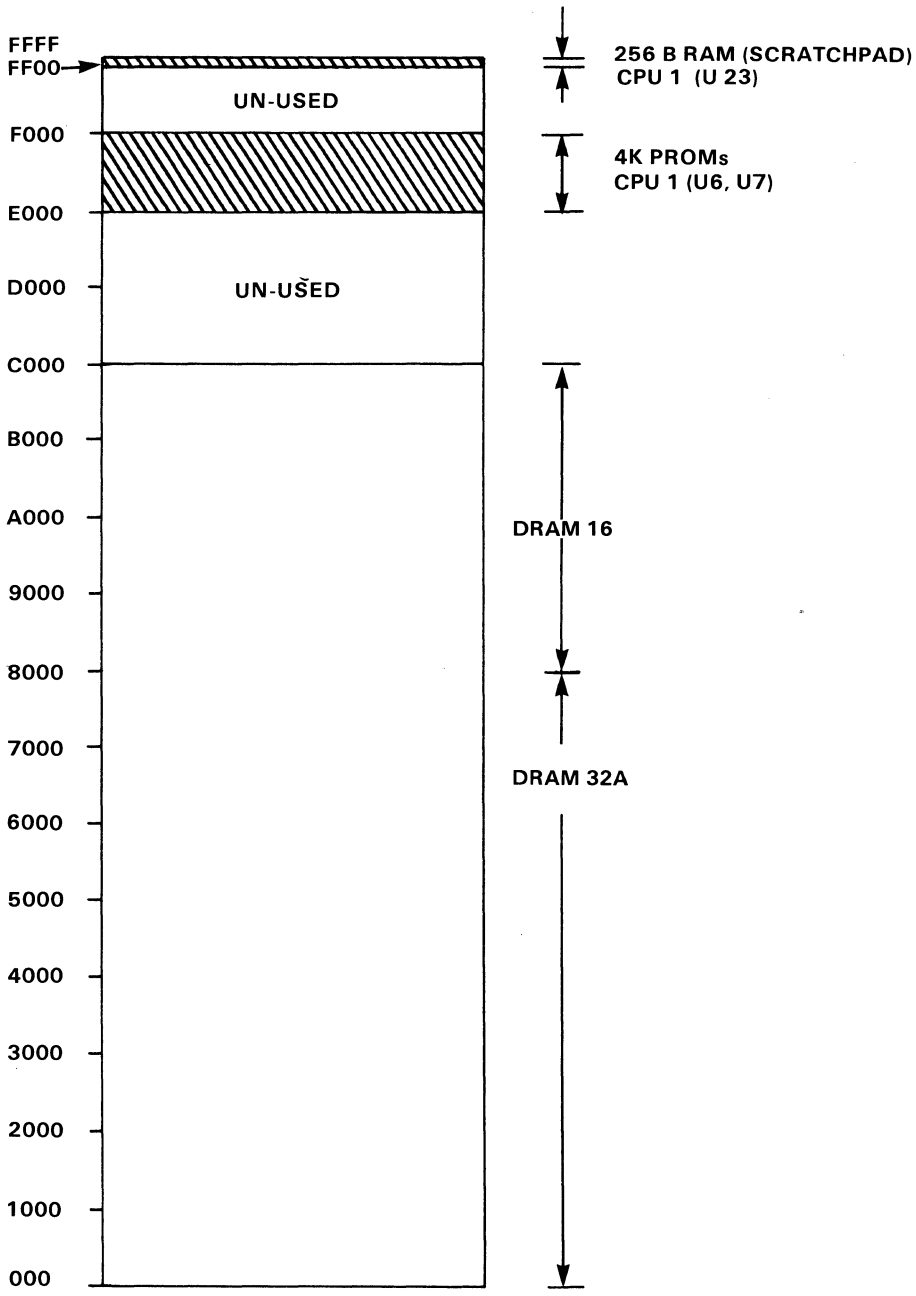
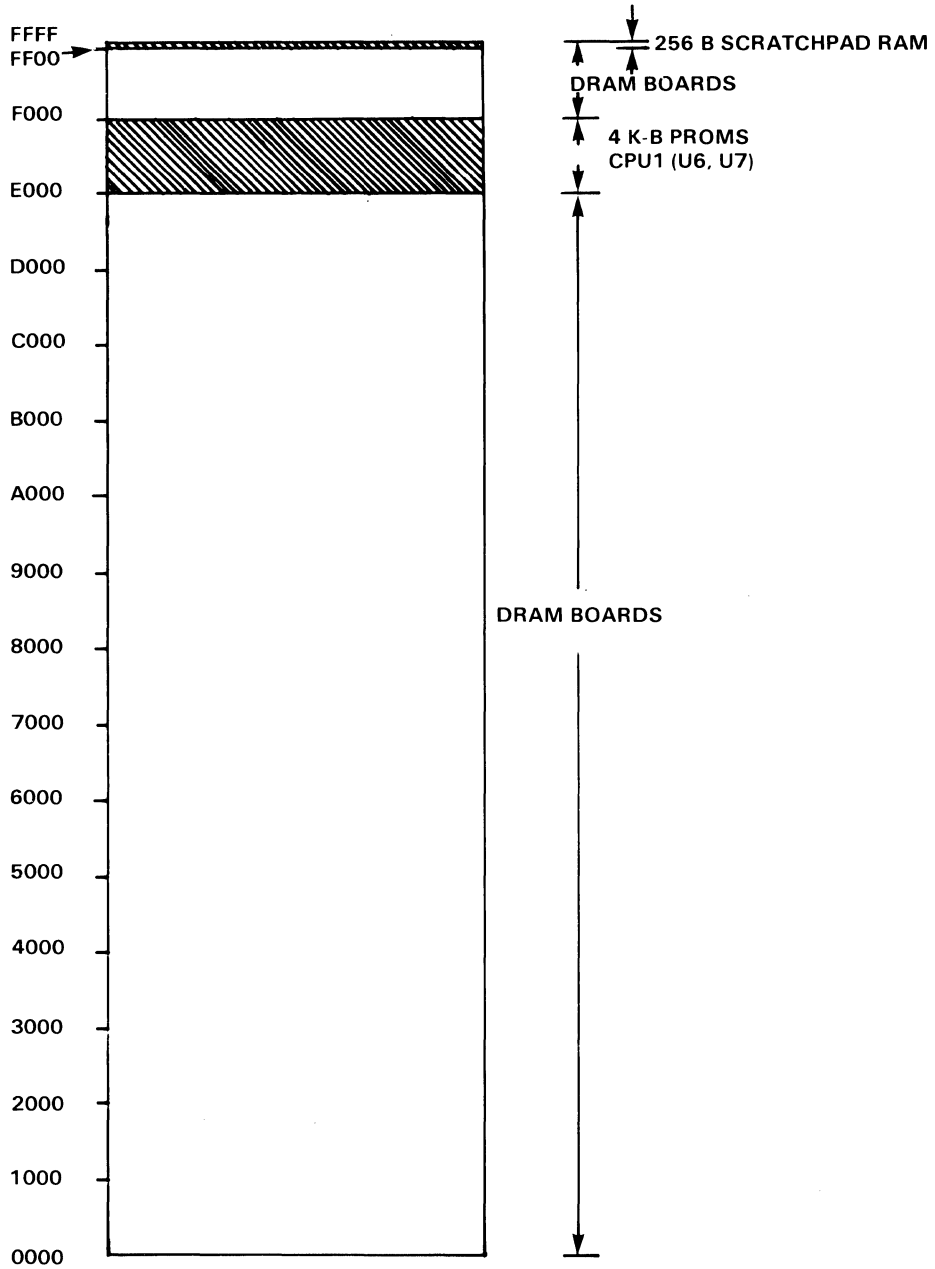


FIGURE 1-3 MEMORY MAP OF THE MATRIX-80/SDT 64K



1.3.1 I/O REAR PANEL

The I/O rear panel of the MATRIX-80/SDT has cutouts for six (6) 25 pin "D" type connectors, two (2) 9 pin "D" type connectors, and a 50 pin ribbon connector. The cutouts are labeled J1 thru J9. J1 is used for channel 1 of the MDX-PIO board. J2 is used for channel 2 of the MDX-PIO. Each channel has two ports, A and B, for a total of 4 user parallel I/O ports. J3, the serial I/O connector, is compatible with RS 232-C terminal devices and 20mA current loop devices. J4 thru J8 are not used. J9 is an expansion connector for use with additional disk drives and is compatible with the Mostek 60Hz MK78183 Dual floppy Enclosure, (RMDFSS), or the 50Hz MK78158 Enclosure, (RMDFSS). Pinouts for J1 are found in Figure 1-4, pinouts for J2 are found in Figure 1-5, and pinouts for J3 are found in Figure 1-6. The FLOPPY pinouts (J9) are shown in Figure 1-7. A view of the I/O panel is shown in Figure 1-8.

1.3.2 SYSTEM PORTS

The following port addresses are used in the MATRIX-80/SDT System.

D0	PIO	DATA	J1
D1	PIO	CONTROL	J1
D2	PIO	DATA	J1
D3	PIO	CONTROL	J1
D4	PIO	DATA	J2
D5	PIO	CONTROL	J2
D6	PIO	DATA	J2
D7	PIO	CONTROL	J2
7C	CTC	CHANNEL 0	
7D	CTC	CHANNEL 1	
7E	CTC	CHANNEL 2	
7F	CTC	CHANNEL 3	
DC	UART	DATA	
DD	UART	CONTROL	
DE	UART	MODEM CONTROL	
E0	FLP	CONTROL	
E1	FLP	CONTROL	
E2	FLP	CONTROL	
E3	FLP	CONTROL	
E4	FLP	CONTROL	
E5	FLP	CONTROL	
E6	FLP	CONTROL	
E7	FLP	CONTROL	

FIGURE 1-4 J1 PINOUT
(VIEWED FROM MATING SIDE)

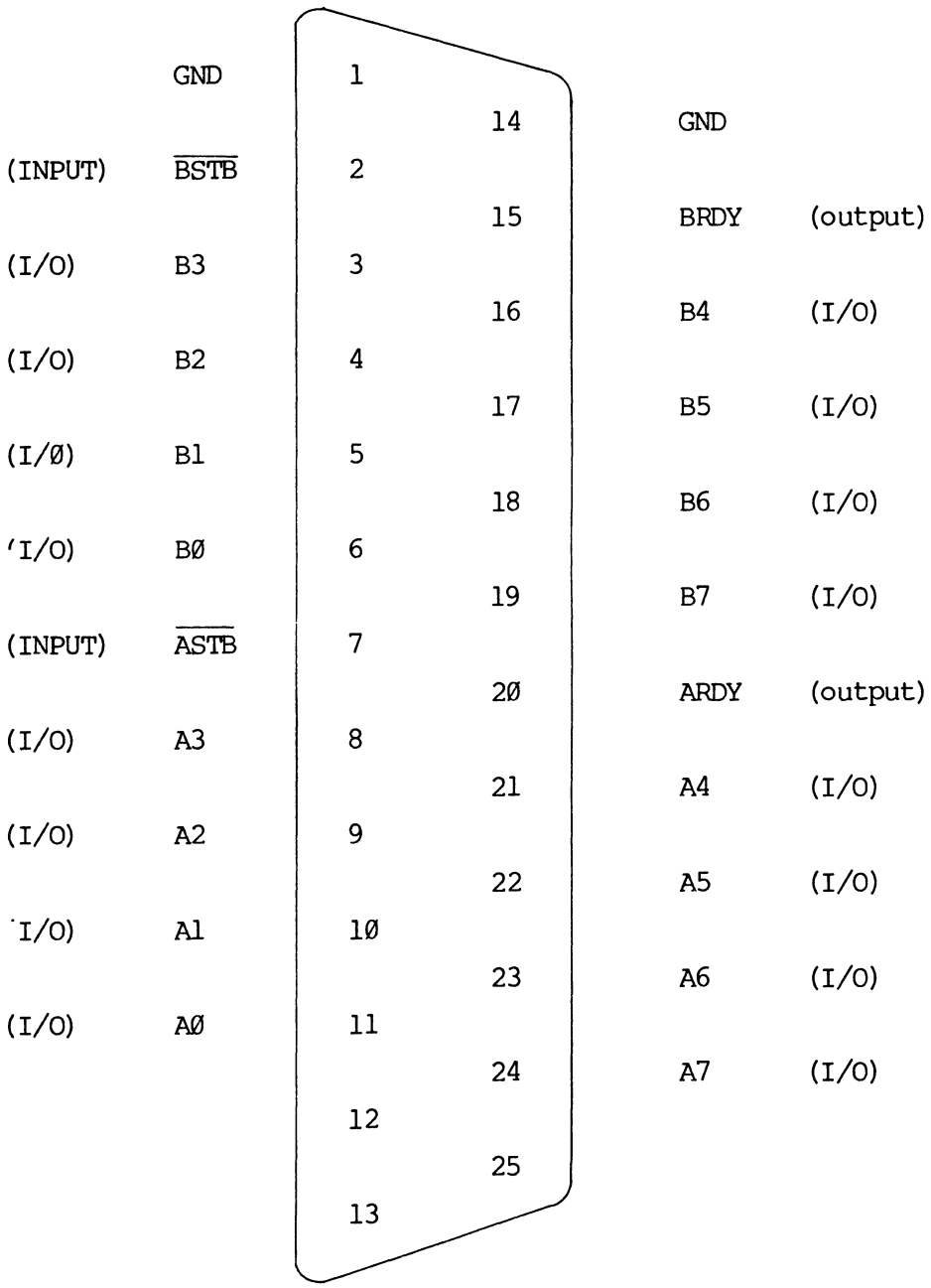


FIGURE 1-5 J2 PINOUT
(VIEWED FROM MATING SIDE)

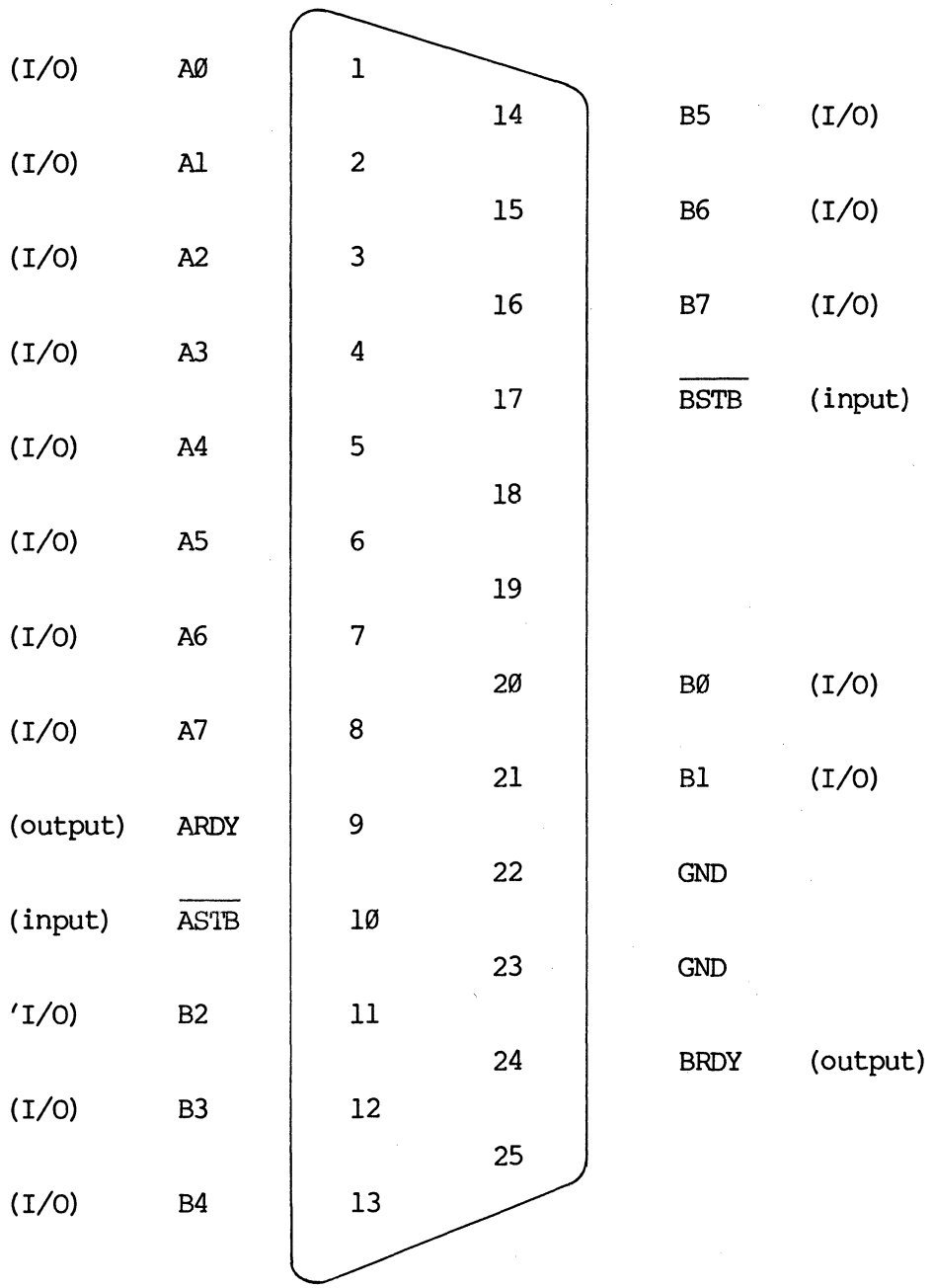


FIGURE 1-6 J3 PINOUT
(VIEWED FROM MATING SIDE)

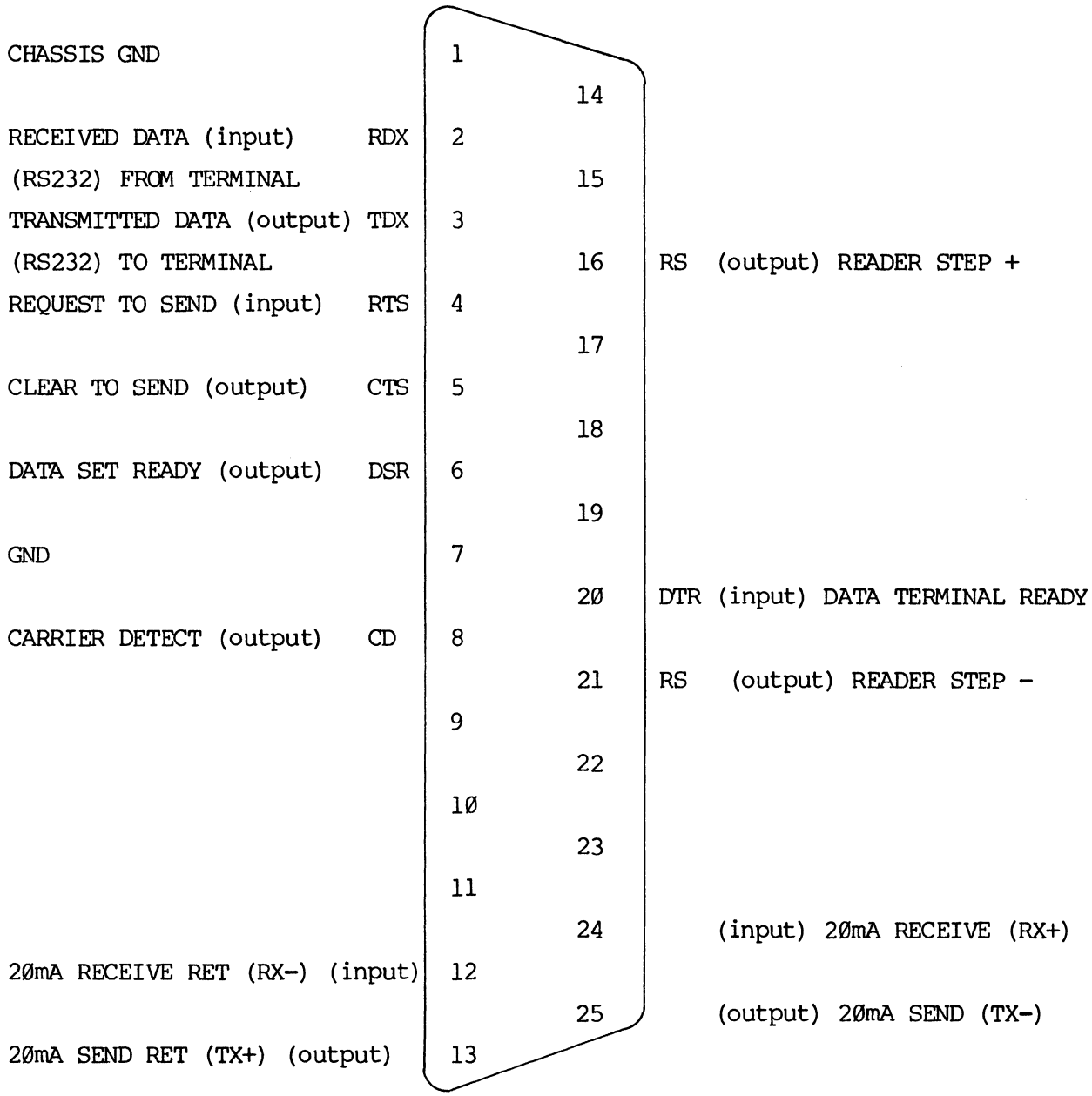
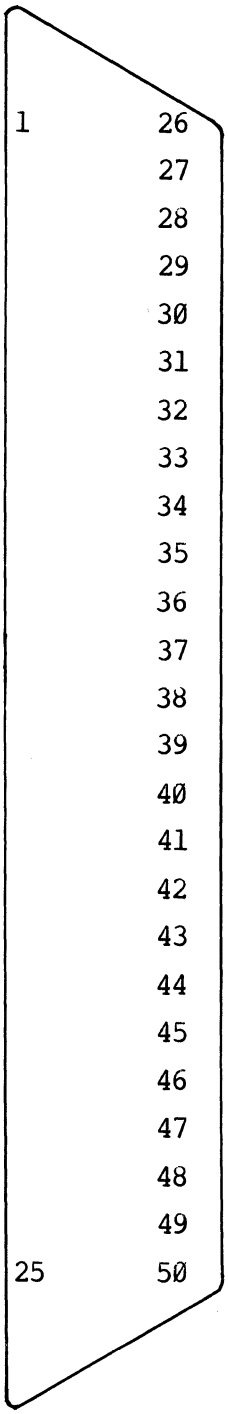


FIGURE 1-7 J9 PINOUT

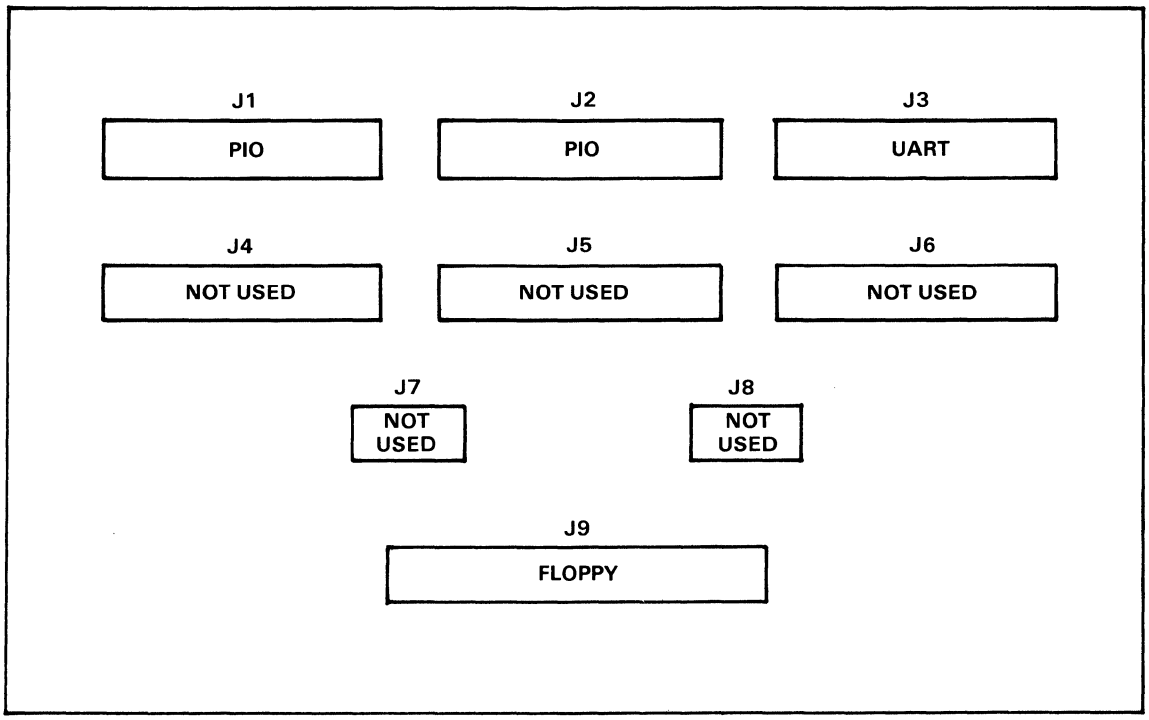
(VIEWED FROM MATING SIDE)



1	26	LOW CURRENT INPUT	
	27	N/C	
	28	N/C	
	29	N/C	
	30	N/C	
	31	DISC	
	32	SIDE SELECT	
	33	IN USE	
	34	HOLD	HLD
	35	INDEX	
	36	READY	RDY
	37	N/C	
	38	DRIVE SELECT 0	DS2
	39	DRIVE SELECT 1	DS1
	40	DRIVE SELECT 2	DS2
	41	DRIVE SELECT 3	DS3
	42	DIRECTION CONTROL	(DIRC)
	43	STEP	
	44	WRITE DATA	(WD)
	45	WRITE GATE	(WG)
	46	TRACK 00	
	47	WRITE PROTECT	(WTPT)
	48	READ DATA	(RDDATA)
	49	SEPARATE DATA	
25	50	SEPARATE CLOCK	

pins 1-25 are Ground.

FIGURE 1-8 I/O PANEL
VIEWED FROM THE REAR



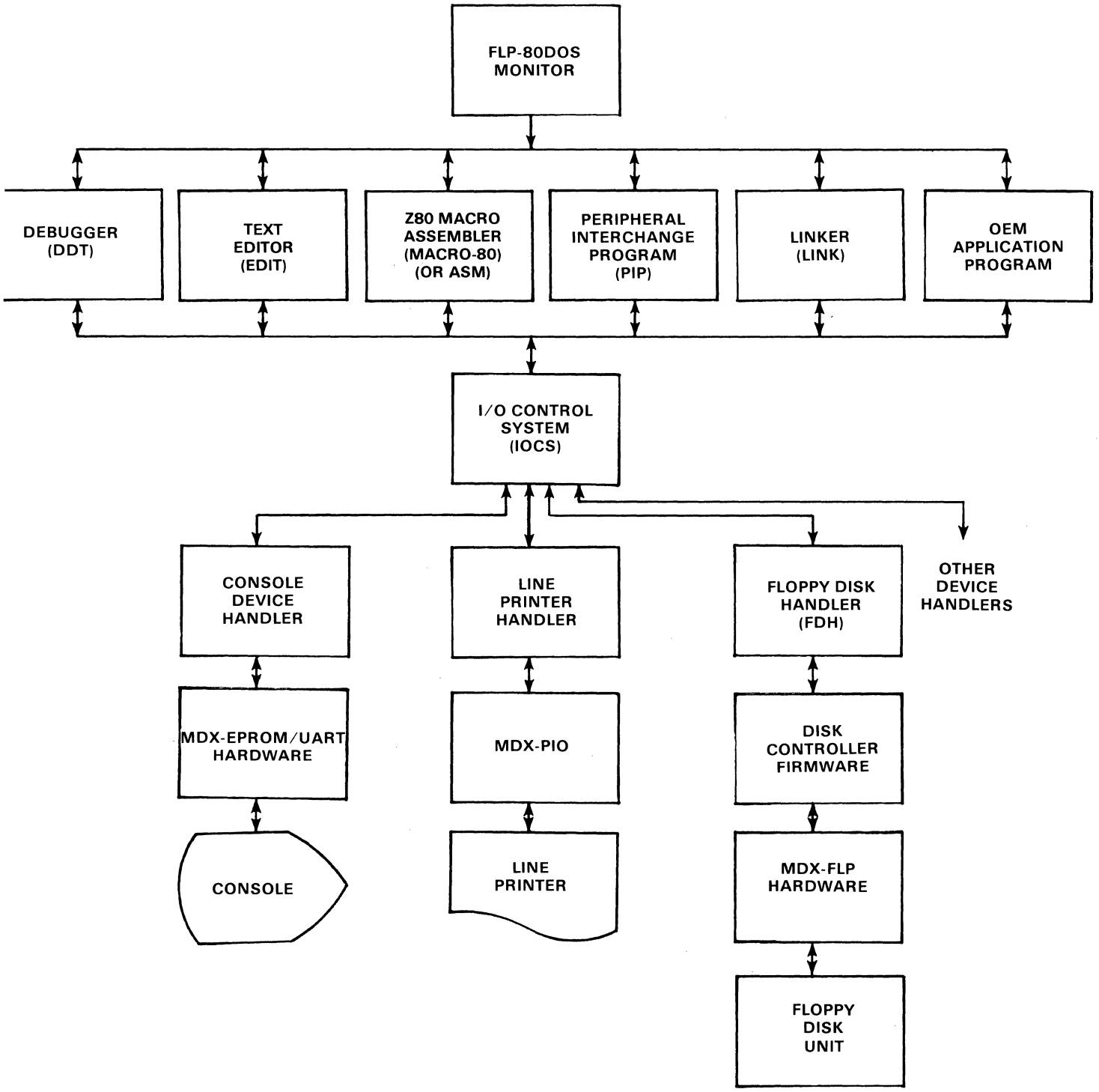
1.4 SOFTWARE DESCRIPTION

The software supplied with MATRIX-80/SDT is called FLP-80DOS and is diagrammed in Figure 1-9. The software package includes the following programs:

1. System Monitor
2. Debugger
3. Text Editor
4. Z80 MACRO Assembler
5. Peripheral Interchange Program
6. Linker
7. Generalized Input/Output Control System (IOCS)
8. Z80 Assembler (ASM)

These programs provide the capability of creating and developing user application software which may be run on MATRIX-80/SDT or the user's own hardware. Cross software is available which runs on MATRIX-80/SDT to support other Mostek microprocessor circuits.

FIGURE 1-9 FLP-80DOS ORGANIZATION



1.4.1 MONITOR

The Monitor provides user interface from the console to the rest of the software. The user can load and run system programs, such as the Assembler, using one simple command. Programs in binary format can be loaded into and dumped from RAM. All I/O is done via channels which are identified by Logical Unit Numbers. The monitor software allows any device handler to be assigned to any logical unit. Flexibility in configuring the system using different peripherals is thus provided. The Monitor also allows two-character mnemonics to represent 16-bit address values, which simplifies the command language. Certain mnemonics are reserved for I/O device handlers in PROM, such as "DK" for the flexible disk handler. The user can create and assign his own mnemonics at any time from the console, thus simplifying the command language for his own use.

1.4.2 DEBUGGER

The Designers Development Tool (DDT) debugger is supplied in PROM. It provides a complete facility for interactively debugging relative and absolute Z80 programs. Standard commands allow displaying and modifying memory and CPU registers, setting breakpoints, and executing programs or subroutines. All commands are single character mnemonics and registers are two-character mnemonics.

1.4.3 TEXT EDITOR

The FLP-80DOS Editor (EDIT) permits random access editing of ASCII text. The Editor works on blocks of characters which are rolled in from disk. It can be used as a line or character oriented editor. Individual characters may be located by position or context. Each edited block is automatically rolled out to disk after editing. Although the Editor is used primarily for creating and modifying assembly language source statements, it may be applied to any ASCII text delimited by "Carriage Returns".

1.4.4 Z80 MACRO ASSEMBLER

The MACRO-80 Assembler reads Z80 source code mnemonics and pseudo-ops and outputs

an assembly listing and object code. The assembly listing shows address, machine code, statement numbers, and source statements. The object code can be suitable for relocation and linking with other modules. The Assembler supports conditional assemblies, global symbols, relocatable programs, a printed symbol cross-reference table, and a full MACRO capability. It can assemble any length program, limited only by the symbol table size. Expressions involving arithmetic and logical operations are allowed.

1.4.5 LINKER

The linker (LINK) provides capability for linking object modules together and creating a binary (RAM image) file on disk. A binary file can be loaded using the Monitor GET or implied RUN commands. Modules are linked together using global symbols for linkage between modules. The Linker produces a global symbol table and a global cross-reference table which may be listed on any output device. The Linker also provides a library search option for all global symbols undefined after the specified object modules are processed. If a symbol is undefined, the Linker searches the disk for an object file having the file name of the symbol. If the file is found, it is opened and linked with the main module in an attempt to resolve the undefined symbol.

1.4.6 PERIPHERAL INTERCHANGE PROGRAM

The Peripheral Interchange Program (PIP) provides complete file maintenance facilities for the system. In addition, it can be used to copy information from any device or file to any other device or file. Version 2.2 or later is used with MATRIX-80/SDT.

1.4.7 DISK SOFTWARE

The Disk software is the heart of the FLP-80DOS Operating System and can be used directly in customer applications. The software consists of programs which provide a complete disk handling facility. The Input/Output Control System (IOCS) is a generalized blocker/deblocker which can interface to any device handler. Input

and output can be done via the IOCS in any of four modes:

1. Single byte transfer.
2. Line at a time, where the end of a line is defined by carriage return.
3. Multibyte transfers, where the number of bytes to be transfered is defined as the logical record length.
4. Continous transfer to end-of-file, which is used for binary (RAM-image) files.

The IOCS provides easy application of I/O oriented packages to any device. There is one entry point, and all parameters are passed via a vector defined by the calling program. Any given device handler defines the physical attributes of its device which are, in turn, used by the IOCS to perform blocking and deblocking. The Floppy Disk Handler (FDH) interfaces IOCS to a firmware controller for up to 4 single density floppy disk units. The FDH provides a sophisticated command structure to handle advanced customer products. The firmware controller interfaces to Mostek's MDX-FLP floppy controller circuit board. The disk format is IBM 3740 soft sectored and can be easily adapted to double sided disks. The FDH has advanced error recovery capability. It supports a bad sector map and an extensive directory which allows multiple users. The file structure is doubly linked to increase data integrity on the disk and a bad file may be recovered from either its start or end.

For specific information on the software commands and operations, refer to the FLP-80DOS Operations Manual, MK78557.

SECTION 2

INSTALLATION

2.1 INTRODUCTION

This section provides installation instructions for the Mostek MATRIX-80/SDT single disk microcomputer system. Procedures described include unpacking, preliminary checks, and system power up. For more details, refer to later chapters of this manual or other manuals associated with the system (e.g. MDX-CPU1, MDX-FLP, FLP-80DOS operation manuals).

2.2 UNPACKING

The MATRIX-80/SDT system should be removed from the shipping container by carefully removing the foam packing material surrounding the enclosure. Open the system by pulling the front bezel off of the system.

2.3 INSPECTION

Inspect the system for shipping damage. Check the boards located in the card cage to assure that they are properly seated in the connectors. Check for loose connectors or wires which may have unseated during shipment. In case of shipping damage, place a claim against the shipping agent who delivered the system.

2.4 CONFIGURING THE SYSTEM

Figure 2-1 shows the placement of the six MDX circuit boards in the card cage. Remove the MDX-EPROM/UART circuit board and set the Baud Rate on Jumper header U8 according to Table 2-1. The board is shipped at a setting of 9600 Baud. Check that the circuit boards are inserted properly and that the appropriate cables are connected on the MDX-FLP, MDX-EPROM/UART and MDX-PIO.

Notice that the SYSTEM is configured such that the MDX-FLP has the lowest interrupt priority. To change this priority, the board's locations should be changed.

FIGURE 2-1 SYSTEM BOARD PLACEMENT
FRONT VIEW

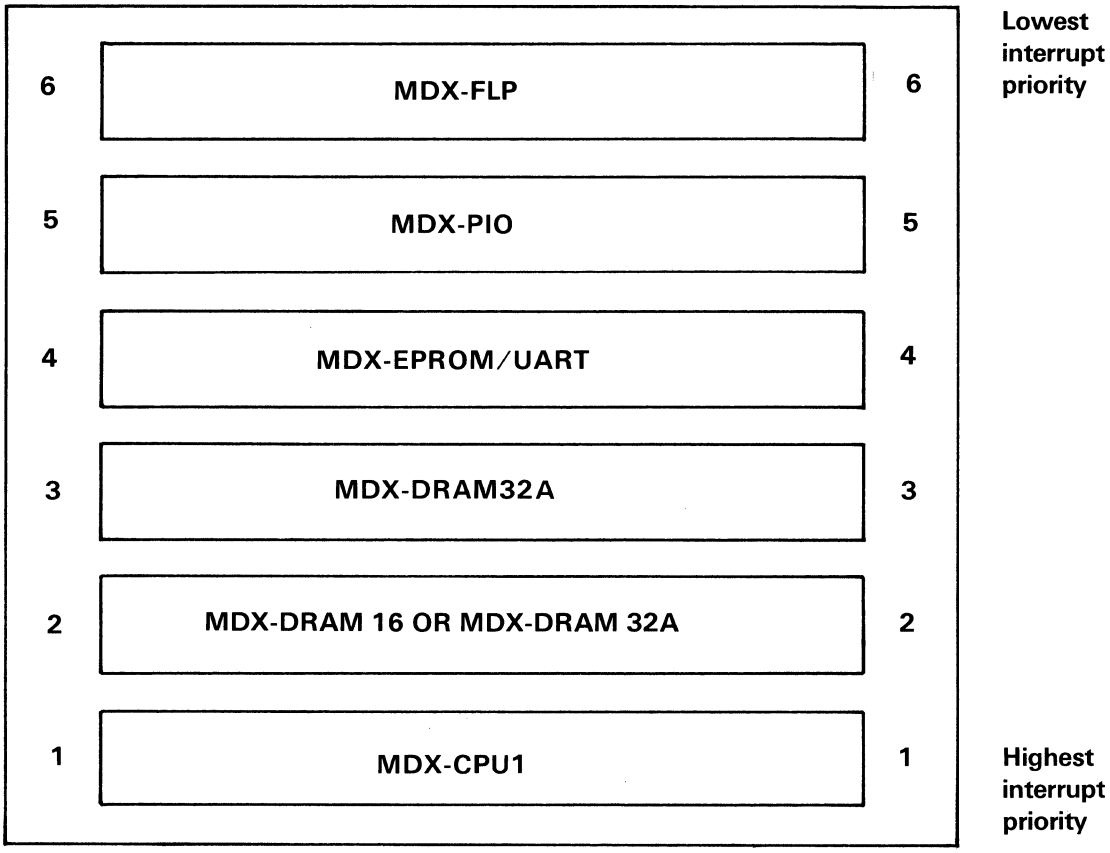


TABLE 2-1 BAUD RATE SELECT TABLE

POSITION 4 3 2 1	BAUD RATE
Ø Ø Ø Ø	5Ø
Ø Ø Ø 1	75
Ø Ø 1 Ø	11Ø
Ø Ø 1 1	134.5
Ø 1 Ø Ø	15Ø
Ø 1 Ø 1	3ØØ
Ø 1 1 Ø	6ØØ
Ø 1 1 1	12ØØ
1 Ø Ø Ø	18ØØ
1 Ø Ø 1	2ØØØ
1 Ø 1 Ø	24ØØ
1 Ø 1 1	36ØØ
1 1 Ø Ø	48ØØ
1 1 Ø 1	72ØØ
1 1 1 Ø	96ØØ
1 1 1 1	192ØØ

1 = OPEN

Ø = CLOSED

U8 switch on MDX-EPROM/UART

2.5 POWER SELECTION

The system has 115/230 volt power selection switch S2 on the lower right-hand section of the rear panel to select between 115 Vac ± 10% operation or 230 Vac ± 10% operation. Set the switch so that the primary voltage available shows through the hole in the rear panel. The disk drive must be factory configured for either 50Hz or 60Hz (verify correct frequency for your installation on the rear panel label).

The system can be operated at 100 Vac ± 10%; however, the following internal wiring changes must be made:

1) Disconnect AC power at the line cord.
2) Remove the top of the unit.
3) Use drawing in Figure 2-2 to help identify the wires to be moved.
4) Unsolder and move all wires except the blue with white stripe wire from pin 1 on the power transformer to pin 2 of that power transformer.
5) Place the power selection switch (S2) in the 115 volt position.
6) Replace top lid. System is now configured for 100 volt ±10% operation.

2.6 STARTING THE SYSTEM

Once power is applied and the terminal is properly connected, the Reset push button may be pressed, followed by the "return" key on the terminal. If no disk isinserted in the system, the system will automatically enter debug (DDT). DDT identifies itself with a period ".". "DSK ERR" is output to the terminal to indicate that the disk was accessed and found to be not ready.

Note that the label on the diskette must face up, the diskette must be pushed in until a "click" is heard and the door must then be shut. To remove the diskette, press the lever just below the disk slot.

If a Mostek FLP-80DOS system disk is inserted in the disk drive (DK0:), then after the RESET/RETURN operation sequence, the disk "HEAD LOAD" lamp on the drive should light, indicating that the disk is being accessed. The monitor will identify itself and the monitor prompt character ('$') will appear after the date or <CR> is entered.

FIGURE 2-2 POWER SUPPLY PRIMARY WIRING
115/230V

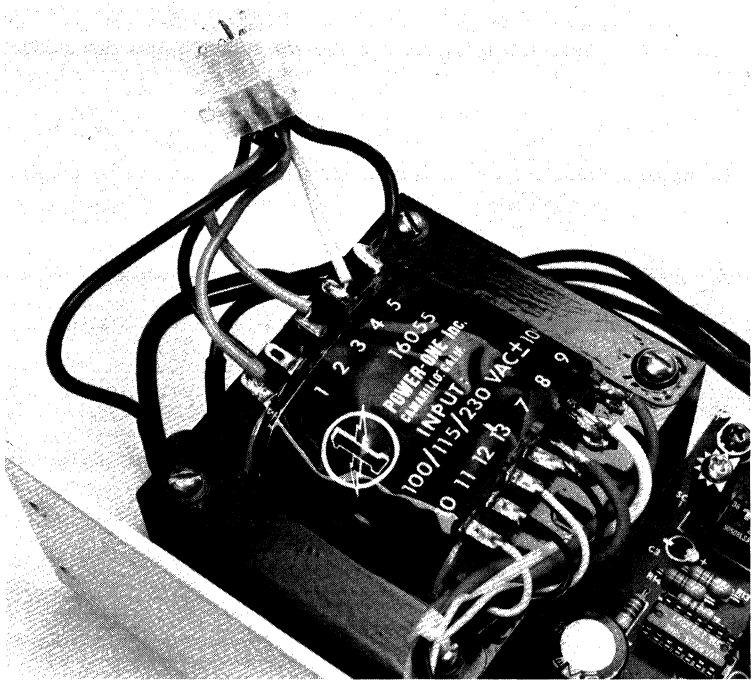
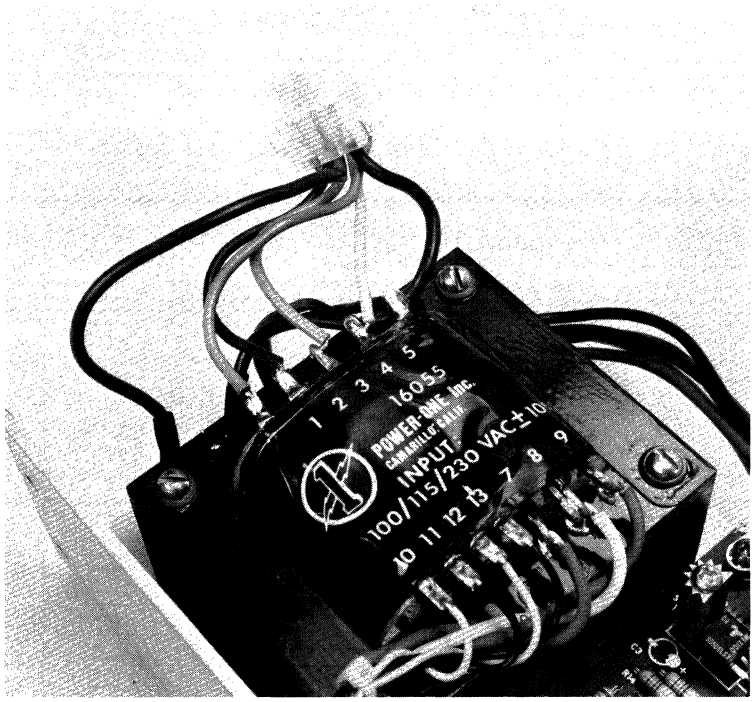


FIGURE 2-3 POWER SUPPLY PRIMARY WIRING
100V



CAUTION: It is very important that power not be applied or removed while a diskette is inserted with the door closed. Spurious write pulses may occur which could destroy data on the disk. Also, "RESET" should not be pressed during disk accesses.

Any activity on the system beyond "RESET" should be attempted only after reading the FLP-80DOS manual and Section 3 of this manual.

2.7 OTHER PERIPHERAL CONNECTIONS

The standard MATRIX-80/SDT system can support the following peripherals without any modification of software or hardware by the user. Other I/O devices must be interfaced by the user. (See Appendix D for complete details on peripheral interfacing).

2.8 LINE PRINTER

The MATRIX-80/SDT system is designed to support a line or character printer with a parallel interface of the Centronics, Manesmann or Data Products type. The standard Matrix system configuration is for a Centronics Printer interface and will interface the Mostek Line Printer, a Centronics 306 or 702 type printer or TI810 with Centronics interface to Matrix system connector J1.

2.9 PROM PROGRAMMER

Mostek PROM Programmers (PPG 8/16) interface to Matrix system connector J2. DC power for the PPG 8/16 is not supplied by the MATRIX-80/SDT and must be connected externally.

2.10 EXTERNAL DISK DRIVES

An external disk unit such as the Mostek dual floppy enclosure can be interfaced to connector J9. When using the dual floppy enclosure, the drive-select jumpers must be configured for DK1 and DK2 to not conflict with DK0 in the MATRIX-80/SDT.

SECTION 3

OPERATION

3.1 INTRODUCTION

The Matrix has been fully tested and burned in by MOSTEK prior to shipment. An initial checkout procedure is included here to provide a simple functional check. If the system fails to perform any of the steps outlined, proceed to Section 5 on Troubleshooting.

3.2 FLOPPY DISKETTE

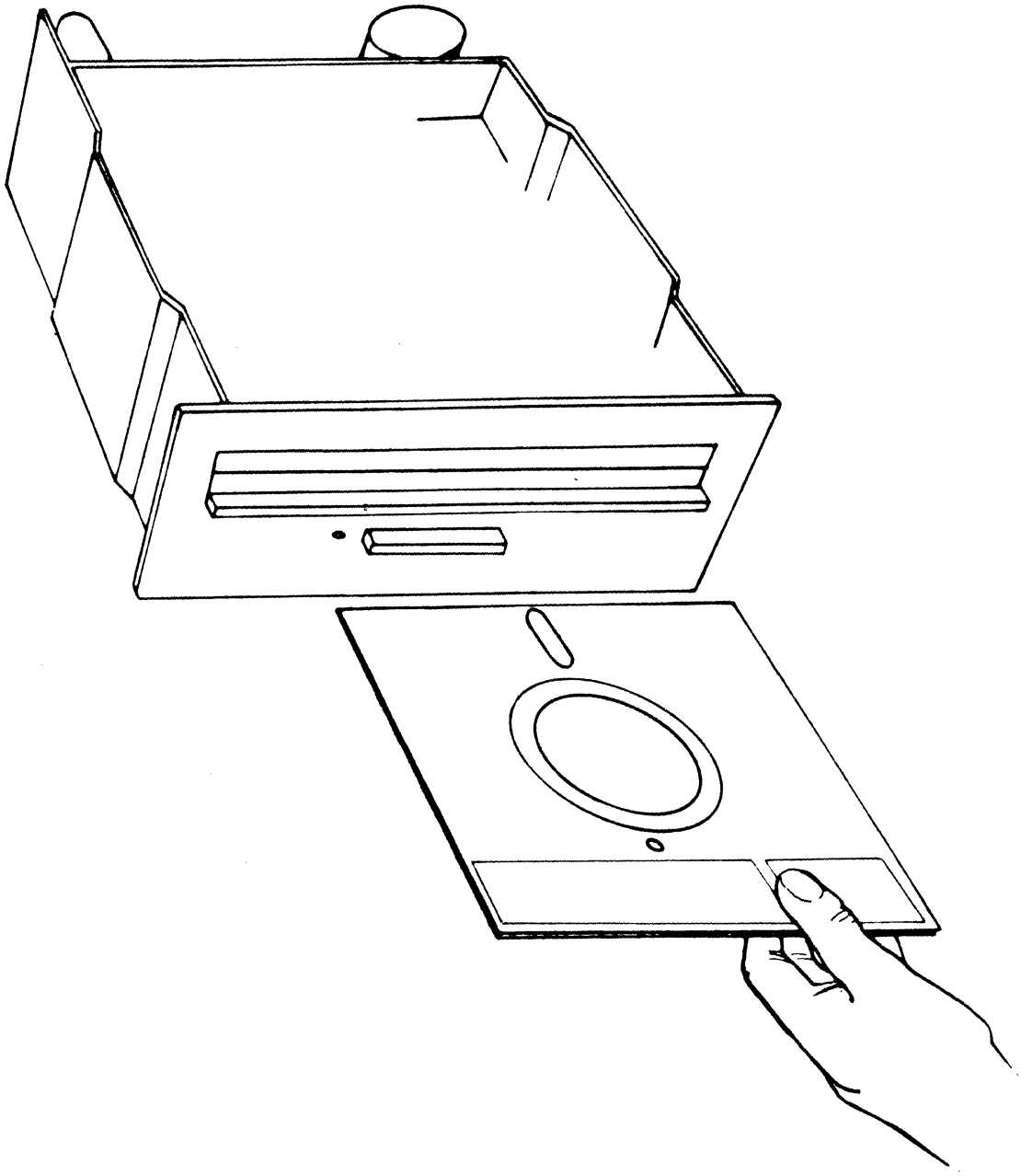
The following are recommendations for extending the life of diskettes used in the MATRIX-8Ø/SDT. Every attempt has been made to design the system for maximum diskette life; however, poor handling practices can cause premature failure of diskette media and/or loss of valuable data.

CAUTION: Do not power the system up or down with a diskette inserted in a disk unit. Doing so may destroy the integrity of the data on the diskette.

3.2.1 DISKETTE LOADING

The diskette is a flexible disk enclosed in a plastic jacket. The interior of the jacket is lined with a wiping material to clean the disk of foreign material. Figure 3-1 shows the proper method of loading a diskette into a Disk Drive. The diskette should be loaded with the power on. To load the diskette, depress the latch, insert the diskette with the label facing up. The diskette is loaded when a "click" is heard. Move the latch handle down slowly to lock the diskette on the drive spindle.

FIGURE 3-1 DISKETTE LOADING



3.2.2 DISKETTE HANDLING

The following are important handling suggestions:

1. Avoid touching exposed areas of magnetic medium.
2. Avoid exposure of diskette to magnetic fields such as motors, fluorescent lamps, transformers, etc.
3. Avoid exposure of diskette to direct sunlight. Do not allow its temperature to be changed suddenly over large ranges. Store flexible diskette in an environment that is between 50 degrees F and 125 degrees F with a relative humidity between 0% and 80%.
4. Avoid contamination and warpage by returning diskette to its envelope when not in use. Store envelope in its box.
5. Avoid placing heavy objects on diskette.
6. Do not write on diskette except on label with a felt-tip pen.
7. Always return diskette to its protective envelope when not in use. Do not attempt to clean the diskette.
8. The flexible diskette should be in the same temperature and humidity environment as the disk drive for a minimum of five minutes.

3.2.3 DISKETTE UNLOADING

Diskettes are removed from the disk unit by depressing the latch button. The disk unit door will open and the diskette will be pushed out of the unit.

3.3 SYSTEM CHECKOUT

The following simple checks will ensure that the system is now functioning properly.

1. Ensure that there is no diskette in the system.
2. Turn the power ON. The power-on indicator should illuminate.
3. Depress the "Carriage Return" key on the terminal. The system should respond with a carriage return, line feed, and the following message:

   DSK ERR

   .

NOTE: The Baud rate is set by a jumper header on the MDX-EPROM/UART circuit board. This baud rate must be set to match the terminal used. If the message on the last step does not appear on your terminal, check the Baud rate and the connections to the terminal. If unable to locate the problem, refer Section 5 of this manual.

3.4 SYSTEM LOADING

Insert one of the supplied FLP-8ØDOS System diskettes into the disk drive (disk unit Ø). Depress the "RESET" button on the Matrix. Depress "Carriage Return" on your terminal. There should be a slight delay while the FLP-8ØDOS software is loaded from the disk unit into RAM. During loading, the LED indicator on the disk unit should illuminate, indicating that the head is being loaded onto the diskette. Then the system should print out on the terminal:

```
MOSTEK FLP-8ØDOS V2.1  ENTER DATE (DD-MMM-YY)-->
```

Enter the current date and type "return." The system should print on the terminal:

```
$
```

If the system fails to perform as described above, repeat the above procedure using the other supplied diskette. If unsatisfactory results are still obtained, refer to the Troubleshooting Section (5).

3.5 HELP FILE

To obtain a print out of the HELP file, type in the following command sequence (user input is underlined).

```
$PIP<CR>
#COPY HELP TO TT:<CR>
```

A paragraph describing the current version of the FLP-8ØDOS software will be printed on your terminal. You can start and stop the listing to the terminal by pressing the space bar on your keyboard.

3.6 SOFTWARE OPERATION

This section describes how to create (edit), assemble, and run a program as well as check the contents of your diskette. A very simple program is used here as a training vehicle. (For a complete description, read the FLP-8ØDOS Operations Manual, MK78557.)

All user input is underlined. Each command entered from your terminal is ended with "carriage return." If you make a typing mistake, you can cancel the line by typing "Control U." Individual characters can be deleted by typing "Rubout" or "Control H" (BACKSPACE).

3.6.1 MONITOR

When you power up or depress "RESET", you must depress "RETURN" on your terminal with the FLP-8ØDOS diskette inserted. The Monitor prompt should appear on your terminal:

```
MOSTEK FLP-8ØDOS V2.1 ENTER DATE (DD-MMM-YY)-->
```

When the system asks for the date, type the correct date terminated by a carriage return.

Any other system program or environment may be run from the Monitor by simply typing in its name.

3.6.2 PERIPHERAL INTERCHANGE PROGRAM (PIP)

The Peripheral Interchange Program (PIP) is used for file maintenance (copying, erasing, etc.). To run PIP, enter the following command (user input is underlined).

```
$PIP<CR>
##PERIPHERAL INTERCHANGE PROGRAM V2.2##

#
```

To list the files on a diskette, enter:

```
#D<CR>
```

EXAMPLE:

```
MOSTEK FLP-8ØDOS V2.1 ENTER DATE (DD-MMM-YY) --> 15-SEP-8Ø
$PIP
PERIPHERAL INTERCHANGE PROGRAM V2.2

                                                    ;comments
#D                                                  ;PIP Directory

DIRECTORY DKØ:  DISKETTE FLP8ØDOS2.1  ON 15-SEP-8Ø
FILENAME EXT  USER RECORDS TRK SECT      FILE-DATE
STI      .SRC    1      2Ø  1DH  Ø8H      21-MAY-79
PPG      .BIN    1      15  Ø5H  17H
OS56K    .CRS    1      21  1ØH  19H      1Ø-SEP-79
PIP      .BIN    1      43  Ø4H  Ø5H
HELPV2   .1      1      7Ø  11H  14H      1Ø-SEP-79
PPGØ8    .BIN    1       8  Ø7H  13H
PP       .SRC    1      16  2ØH  14H      21-MAY-79
LPD      .SRC    1      24  21H  ØDH      21-MAY79
OS       .CRS  255      22  Ø9H  14H      1Ø-SEP-79

#S                                                  ;PIP Disk Status

STATUS DKØ: DISKETTE FLP8ØDOS2.1
SECTORS AVAILABLE     346
SECTORS USED         1618
SECTORS BAD             Ø

#Q                                                  ;Quit

$
```

The above files are on the FLP-8ØDOS diskette supplied to you. To determine how

much space is available, enter:

```
#S<CR>
```

Each sector is 124 data bytes long. To get back to the Monitor, enter:

```
#Q<CR>
```

3.6.3 ENTERING PROGRAMS

The Text Editor allows you to create or modify a program on the disk. In this session, we will create a simple program to echo characters on your terminal. Enter the following information (recall that "Control-U and Rubout" can be used to change entered input before a carriage return is entered):

```
$EDIT SIMPLE<CR>

--> NEW FILE
--> INSERT MODE
0001<
```

The file name to be created is "SIMPLE". The Editor shows that it is a new file, and you can start typing in the program immediately. Each new line of input is prompted by <. A carriage return ends the line. At the end of the program, enter two carriage returns as shown to complete the input:

```
<          ORG     0000H <CR>   ; comments
<          PSECT   ABS   <CR>
<RDCHR     EQU     0E522H<CR>   ; System Firmware
<WRCHR     EQU     0E527H<CR>   ; System Firmware
<;<CR>
<          LD      E,0<CR>
<LOOP      CALL    RDCHR<CR>
<          CALL    WRCHR<CR>
<          JP      LOOP<CR>
<          END     <CR>
<<CR>

>
```

The Editor is now waiting for a command to finish up the session. Enter:

```
>Q<CR>

--> END OF EDITING
$
```

The entered lines have been stored in file "SIMPLE" on the diskette. Now we will assemble and execute the program.

3.6.4 ASSEMBLING A PROGRAM

In this example, we will create an object file for our SIMPLE program and list it on the terminal. Enter:

```
$MACRO SIMPLE TO TT:<CR>

MOSTEK MACRO-8Ø ASSEMBLER V2.2 OPTIONS?<CR>
PASS 1 DONE

.
.     listing will be printed here
.

$
```

3.6.5 LINKING, LOADING AND EXECUTING A PROGRAM

To link the object program for execution, we use the Monitor Link command. We are going to link our program at location zero:

```
$LINK        SIMPLE<CR>

OPTIONS?<CR>
```

To load the program and start execution, enter:

```
$SIMPLE<CR>
```

Now, any characters entered from the terminal will be echoed back to the terminal. To get out of the SIMPLE program, depress the RESET button on the MATRIX-80/SDT and then "RETURN" on your terminal. The Monitor prompt should appear on your terminal. You may wish to verify that the files "SIMPLE", "SIMPLE.OBJ", and "SIMPLE.BIN" are on the diskette. Run PIP and use its "D" command. See FLP-80DOS Operations Manual or Section 3.6.6, HELPME. You should next study the FLP-80DOS Operation Manual to become fully familiar with operating the system.

3.6.6 HELPME

A quick summary of the operating commands for any of the FLP-80DOS programs is available on the CRT by the use of the HELPME system utility. From the Monitor ($ prompt) you can request these command summaries by typing one of the following:

```
$HELPME MON<CR>
$HELPME DDT<CR>
$HELPME EDIT<CR>
$HELPME MACRO<CR>
$HELPME LINK<CR>
$HELPME PIP<CR>
```

3.7 SOFTWARE CONFIGURATION

The FLP-80DOS system diskette, shipped with this product is for use with a 64K byte system. Should you desire to convert to a different system configuration, refer to the Mostek FLP-80DOS V2.1 Operations Manual (MK78557) for operating system generation.

SECTION 4

MAINTENANCE

4.1 PC MODULES

The MDX-CPU1, MDX-DRAM, MDX-FLP, MDX-PIO and MDX-EPROM/UART circuit boards require no preventive maintenance.

4.2 POWER SUPPLY

The power supply assembly requires no periodic maintenance. If it is noticed that DC voltages have drifted from nominal values, adjustment facilities are available on each regulator card. However, this determination should be made only with a high impedance voltmeter at normal operating ambient temperature.

4.3 FAN

The temperature within the MATRIX-80/SDT is very important to achieve error-free operation. The diskette material has an operating temperature range of 10°C (50°F) to 49°C (120°F) for prolonged life and error free operation. It is therefore important to keep the fans located on the side of each subsystem free from obstructions and in good working order. The power supplies have a 180°F thermal breaker and should the temperature inside the units get too high, the breakers will shut down the system. Fan screen should be cleaned monthly.

CAUTION: Do not operate the MATRIX-80/SDT if the fan is not functioning properly.

4.4 DISK DRIVE

4.4.1 MAINTENANCE

The disk drive requires preventive maintenance every 12 months under normal usage. See Appendix B for complete details. Cleanliness is very important to successful

operation of the MATRIX-8Ø/SDT. The fan should be free from dirt, lint, etc. Do not lubricate the disk drive unit; oil will allow dust and dirt to accumulate. The read/write heads on the disk unit should be cleaned only when signs of oxide build up are present. Oxide build-up will cause premature failure of diskette material.

Occasional inspection of read/write heads and diskette will monitor this condition.

4.4.2 DISK DRIVE REMOVAL

Preventive maintenance or inspection of the drive unit requires removal from the MATRIX-8Ø/SDT. The following procedure describes drive removal:

1. Remove all power from the MATRIX-8Ø/SDT.
   CAUTION: High AC voltages are present within the system even with the AC switch OFF. Remove the line cord from the wall outlet.
2. Pop off lid of system by pulling upward.
3. Remove P1 (signal), P4 (AC), and P5 (DC) connectors from back of the drive. The P4 and P5 connectors are removed by depressing the tabs extending from the side of the connectors. For more details, refer to the MDX-FLP manual.
4. Carefully remove the bezel from around the face of the unit by pulling forward.
5. Remove the front and rear screws (3) holding the bracket below the drive to the baseplate.
6. Remove the disk unit out the front of the enclosure.
7. Lay the drive upside down on its top and remove the four screws that hold the mounting bracket to the drive frame.
8. To replace drive, use the reverse procedure.

SECTION 5

TROUBLESHOOTING

5.1 INTRODUCTION

This section contains a troubleshooting guide for some specific problems which might occur with the MATRIX-8Ø/SDT system.

SYMPTOMS	THINGS TO CHECK
1. POWER ON indicator does not illuminate.	1. Power to line cord? 2. Fuse F1 good? 3. LED defective?
2. POWER ON indicator illuminates, fan runs, drive spindle does not turn.	1. Drive belt broken or off pulley 2. AC wiring.
3. POWER ON indicator illuminates No diskette in drive Ø depressing "CARRIAGE RETURN" fails to print the following message DSK ERR .	1. No message at all: check terminal communication cables, terminal, and that cards are seated in connectors. Check Baud rate setting. 2. No period: check card seating.
4. Prompt "." is printed on terminal with no diskette inserted. Inserting one of supplied diskettes into the disk drive, and depressing "return" fails to print the following message after a short delay:	1. Check that the interconnect cable is connected between disk drive and the MDX-FLP 2. Try second supplied diskette 3. Check that drive Ø spindle is turning

$MOSTEK FLP-8ØDOS ...	4. Check card seating 5. Check DC voltages 6. MDX-FLP (refer to MDX-FLP Manual)
5. The following fails to copy "HELP" file to the terminal. $PIP <CR> #COPY HELP TO TT:<CR>	1. Try second supplied diskette 2. FLP-8ØDOS manual
6. Copy "HELP" to terminal functions correctly but the system integrity is questioned.	1. Run diagnostic package (DSKDIA). 2. Refer to MDX-CPU1, MDX-FLP, MDX-EPROM/UART or disk drive manuals for further information.

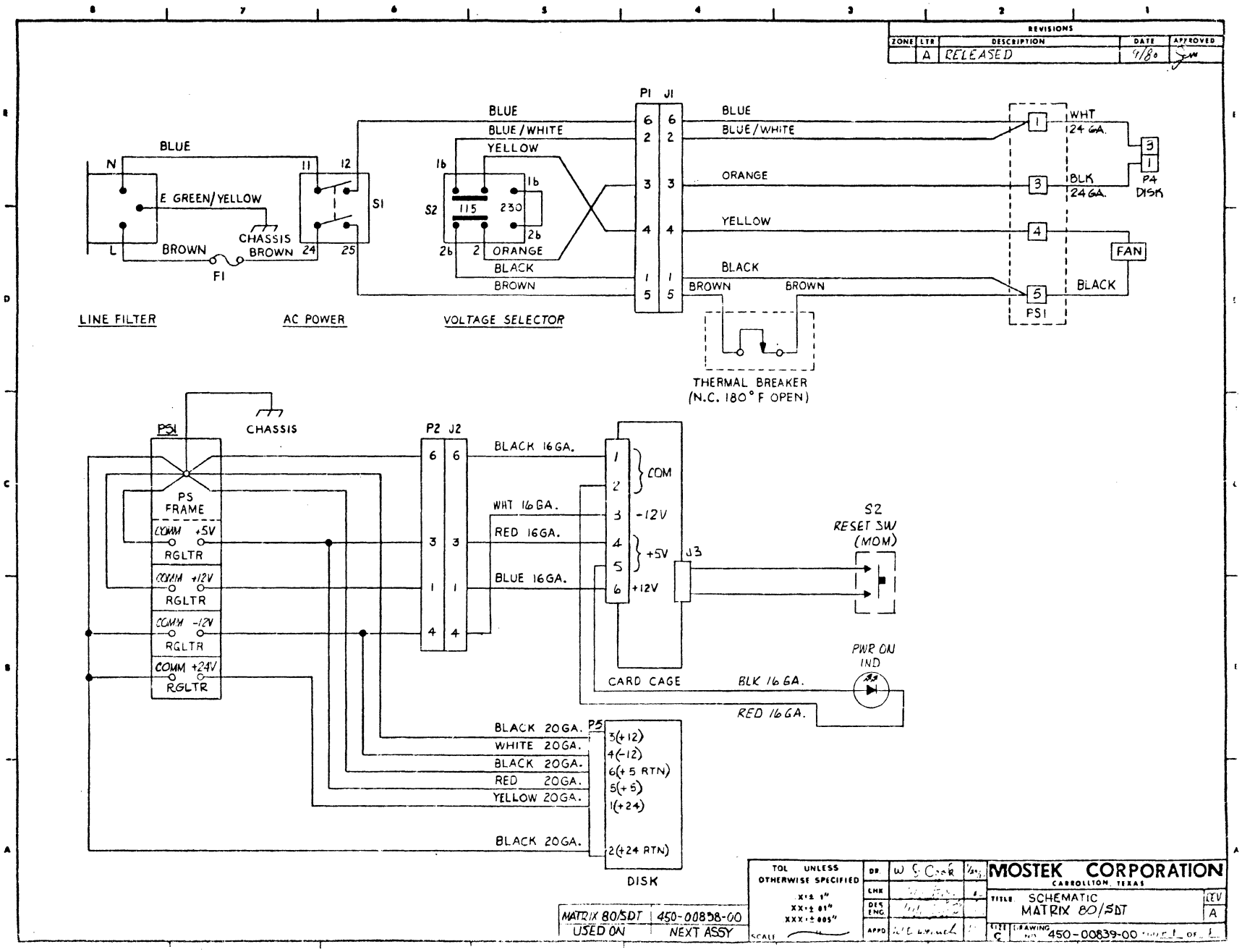
If all else fails, contact Mostek for assistance.

APPENDIX A

SCHEMATICS

PARTS PLACEMENTS

PARTS LIST



SCHEMATIC, MATRIX-80/SDT

TOP ASSEMBLY, MATRIX-80/SDT

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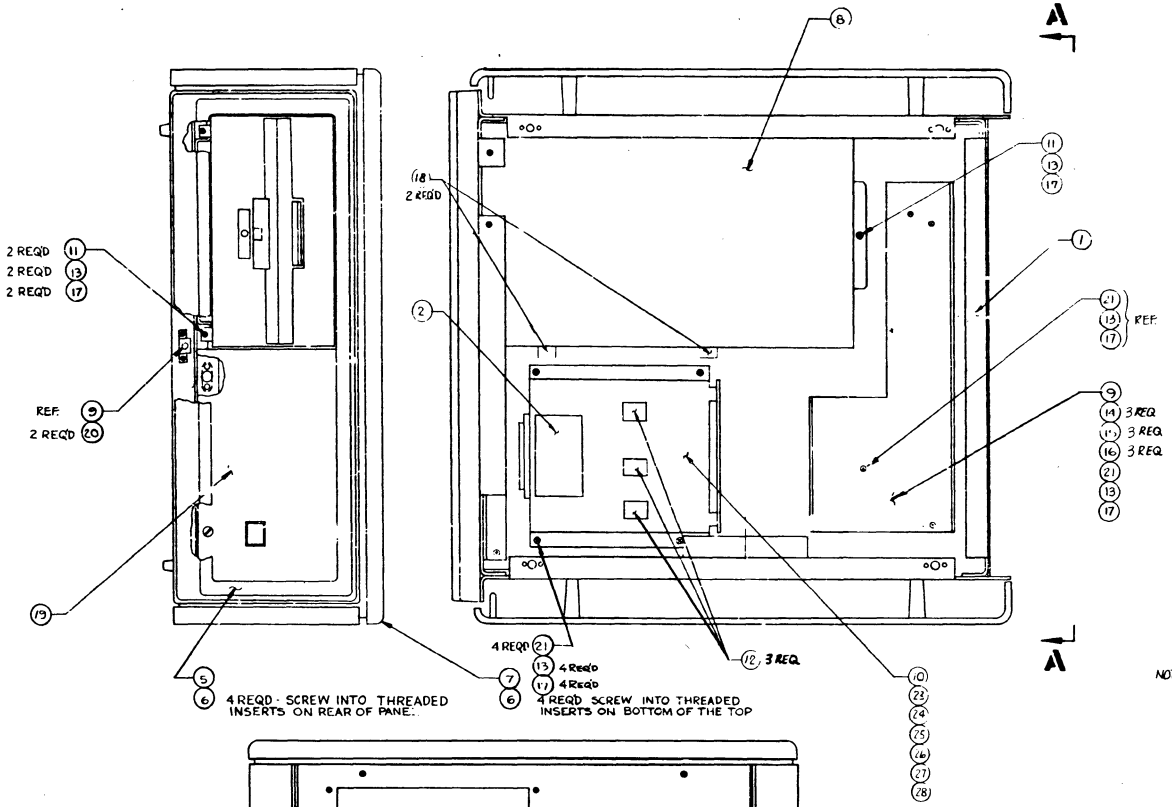
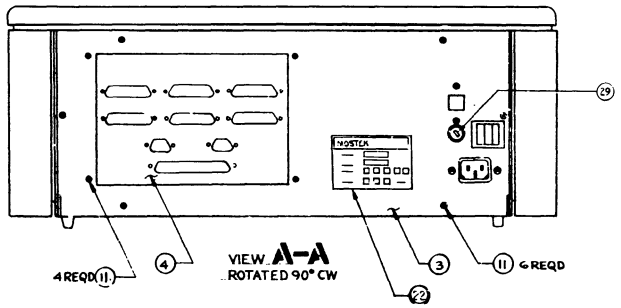
NOTES:

REVISIONS			
LTR	DESCRIPTION	APPD	DATE
A	RELEASED		
B	NC PER ECN NO 3110961		1-7-80





NOTES.
1. FOR MK 78197 (48K SYSTEM) PARTS LIST REFER TO DWG NO. 450-20838-00 AND FOR MK 78206 (64K SYSTEM) PARTS REFER TO DWG. NO 450-20838-10

DWG REQD	ITEM NO	PART NUMBER	DRAWING NO	DESCRIPTION

MATERIAL —
FINISH —
DRAWN 1/14/80
CHK'D 1-80
ENG 1-9-80
REL 1-80

UNLESS OTHERWISE SPECIFIED
ALL DIMENSIONS ARE IN INCHES
ALL DIMENSIONS ARE IN MILLIMETERS
TOLERANCES
CONCENTRICITY OF MACHINED DIAMETERS .002 THE INCHES OR 1 MILLIMETER
REMOVE ALL BURRS AND SHARP EDGES
ALL DIMENSIONS TO BE SET AFTER PLATING
DO NOT SCALE THIS DRAWING

MOSTEK — MOSTEK Corporation, Carrollton, Texas 75006

TOP ASSY, MATRIX 80/SDT

MATRIX 80/SDT | USED ON | NEXT ASSY
APPLICATION FOR REFERENCE ONLY

SIZE D | CAT/PROJ NO. 450-00838-00 | REV E

SCALE 1/2

PARTS LIST, MATRIX-80/SDT 48K

P/N	QTY.	DESCRIPTION	ITEM NO.	DRAWING NO.
0000000		* MATRIX 80-SDT TOP ASSY *		
0000001		PART LIST MATRIX 80/SDT	A	
0000002		TOP ASSY. SUB ASSYs NOTED	B	
0000003		BY PART # STARTING W/ 20.	C	
0000004		SEE P/L FOR SUBASSY FOR	D	
0000005		ADDITIONAL PARTS.	E	
0000006		QTY UT PART DESCRIPTION ITEM#	F	DRAWING NO.
0000007		TOP ASSY.MATRIX 80/SDT	G	450-00838-00 REV A1
0000008		SCHEMATIC MATRIX 80/SDT	H	450-00839-00 REV A
2073400	1	FRAME ASSY	1	450-00734-00 REV B
5025360	1	LABEL,BRD. ORIENTATION	2	450-00852-00 REV A
2054900	1	PANEL ASSY,REAR	3	450-00549-00 REV B1
2084800	1	PANEL ASSY,I/O	4	450-00848-00 REV A
4140323	1	BEZEL	5	450-00440-00 REV C1
4280899	8	BALL STUD	6	
4140326	1	TOP SKIN	7	450-00443-00 REV C1
2063811	1	ASSY, DISC DRIVE	8	450-00638-11 REV B1
2083700	1	PWR. SUPPLY ASSY. CP237A	9	450-00837-00 REV A1
2066610	1	CARD CAGE ASSY	10	450-00666-10 REV A
4210339	13	SCREW,#6-32 X 3/8 PPH	11	
4210095	3	CLAMP,CABLE	12	
4210348	8	WASHER,#6 EXT TOOTH	13	
4210346	3	SCREW,#8-32 X 1/2 PPH	14	
4210351	3	WASHER,#8 FLAT	15	
4210349	3	WASHER,#8 EXT TOOTH	16	
4210350	8	WASHER,#6 FLAT	17	
4210362	2	CLAMP,CABLE 1/4"	18	
2079300	1	FRONT PANEL ASSY	19	450-00793-00 REV C
4280525	2	SCREW,#4-40 X 3/8 PPH	20	
4210347	5	SCREW,#6-32X7/16 PPH BO	21	
5025979	1	LABEL,MFG LOGO	22	450-00621-00 REV A
2047311	1	MDX FLP	23	450-00473-11 REV A
2035812	1	MDX CPU1 SUBASSY	24	450-00358-12 REV A
2036117	1	MDX DRAM 16 SUBASSY	25	450-00361-17 REV A
2036116	1	MDX DRAM 32 SUBASSY	26	450-00361-16 REV A
2036715	1	MDX EPROM UART	27	450-00367-15 REV A
2037015	1	MDX PIO	28	450-00370-15 REV A
7000000		THIS IS THE PACK LIST FOR THE	ZA:	ITEMS WITH DESIGNATOR
7000001		MATRIX 80/SDT.	ZB:	(:)ARE SHIPPED W/PROD
MK79899	1	MATRIX 80/SDT OPS. MAN.	ZC:	REV (2-81)
MK79612	1	MDX-CPU1 OPS MANUAL	ZD:	REV (12-78)
MK79624	1	MDX-DRAM OPS MANUAL	ZE:	REV (08-80)
MK79604	1	MDX-EPROM/UART OPS MAN.	ZF:	REV (01-80)
MK79606	1	MDX-PIO OPS MANUAL	ZG:	REV (12-79)
MK79639	1	MDX-FLOPPY OPS MANUAL	ZH:	REV (12-79)
MK78557	1	FLP-80 DOS OPS MANUAL	ZI:	REV (01-80)
MK79668	1	FLP-80 DOS/MDX MANUAL	ZJ:	REV (05-79)
MK78515	1	Z-80 PROGRAMMING MANUAL	ZK:	REV (01-78)
MK79635	1	MACRO 80 V2.1 OPS MANUAL	ZL:	REV (01-79)
MK78516	1	MICRO-REFERENCE MANUAL	ZM:	REV (02-78)
MK79869	1	SERVICE CENTER POLICY	ZN:	
MK79925	1	ERRATA SHEET-PIP V.2.2	ZO:	

PARTS LIST, MATRIX-8Ø/SDT 48K

P/N	QTY.	DESCRIPTION	ITEM NO.	DRAWING NO.
MK79912	1	ERRATA SHEET MDX PIO	ZP:	
MK79858	1	ERRATA SHEET MDX-CPU1	ZQ:	
MK79849	1	EPRATA SHEET EPROM/UART	ZR:	
MK79928	1	ERRATA SHEET MDX-FLP	ZS:	
MK79976	1	ERRATA SHEET MDX-DRAM32A	ZT:	
4200209	1	FLP-80 DOS V2.2 DISKETTE	ZU:	
4600056	1	POWER CORD U.S.	ZV:	
5013004	6	MD SIZE ANTI-STATIC BAGS	ZW:	
5025974	1	BOX W/FOAM PACKING.	ZX:	

PARTS LIST, MATRIX-80/SDT 64K

P/N	QTY.	DESCRIPTION	ITEM NO.	DRAWING NO.	ASSY.
0000000	* MATRIX 80-SDT TOP ASSY *				
0000001	PART LIST MATRIX 80/SDT 64K		A		
0000002	TOP ASSY. SUB ASSYs NOTED		B		
0000003	BY PART # STARTING W/ 20.		C		
0000004	SEE P/L FOR SUBASSY FOR		D		
0000005	ADDITIONAL PARTS.		E		
0000006	QTY UT PART	DESCRIPTION ITEM#	F	DRAWING NO.	ASSY.
0000007		TOP ASSY.MATRIX 80/SDT	G	450-00838-00 REV B	2083810
0000008		SCHEMATIC MATRIX 80/SDT	H	450-00839-00 REV A	2083810
2073400	1	FRAME ASSY	1	450-00734-00 REV B	2083810
5025375	1	LABEL,P.C.B. LOCATOR	2	450-00920-00 REV A	2083810
2054900	1	PANEL ASSY,REAR	3	450-00549-00 REV B	2083810
2084800	1	PANEL ASSY,I/O	4	450-00848-00 REV A	2083810
4140323	1	BEZEL	5	450-00440-00 REV C1	2083810
4280899	8	BALL STUD	6		2083810
4140326	1	TOP SKIN	7	450-00443-00 REV C1	2083810
2063811	1	ASSY, DISC DRIVE	8	450-00638-11 REV A1	2083810
2083700	1	PWR. SUPPLY ASSY. CP237A	9	450-00837-00 REV A1	2083810
2066610	1	CARD CAGE ASSY	10	450-00666-10 REV A	2083810
4210339	13	SCREW,#6-32 X 3/8 PPH	11		2083810
4210095	3	CLAMP,CABLE	12		2083810
4210348	8	WASHER,#6 EXT TOOTH	13		2083810
4210346	3	SCREW,#8-32 X 1/2 PPH	14		2083810
4210351	3	WASHER,#8 FLAT	15		2083810
4210349	3	WASHER,#8 EXT TOOTH	16		2083810
4210350	8	WASHER,#6 FLAT	17		2083810
4210362	2	CLAMP,CABLE 1/4"	18		2083810
2079300	1	FRONT PANEL ASSY	19	450-00793-00 REV C	2083810
4280525	2	SCREW,#4-40 X 3/8 PPH	20		2083810
4210347	5	SCREW,#6-32X7/16 PPH BO	21		2083810
5025979	1	LABEL,MFG LOGO	22	450-00621-00 REV A	2083810
2047311	1	MDX FLP	23	450-00473-11 REV A	2083810
2035813	1	MDX CPU1 SUBASSY	24	450-00358-13 REV A	2083810
2036118	1	MDX DRAM 32A SUBASSY	25	450-00361-18 REV A	2083810
2036119	1	MDX DRAM 32A SUBASSY	26	450-00361-19 REV A	2083810
2036715	1	MDX EPROM UART	27	450-00367-15 REV A1	2083810
2037015	1	MDX PIO	28	450-00370-15 REV A	2083810
4510039	1	FUSE 3AG,3AMP SP	29		2083810
4510031	1	INSERT 3AG,FUSE	30		2083810

PARTS LIST, MATRIX-80/SDT 64K

P/N	QTY.	DESCRIPTION	ITEM NO.	DRAWING NO.
7000000		THIS IS THE PACK LIST FOR THE	ZA:	ITEMS WITH DESIGNATOR
7000001		MATRIX 80/SDT.	ZB:	(:)ARE SHIPPED W/PROD
MK79899	1	MATRIX 80/SDT OPS. MAN.	ZC:	REV (2-81) 2083810
MK79612	1	MDX-CPU1 OPS MANUAL	ZD:	REV (12-78) 2083810
MK79624	1	MDX-DRAM OPS MANUAL	ZE:	REV (08-80) 2083810
MK79604	1	MDX-EPROM/UART OPS MAN.	ZF:	REV (01-80) 2083810
MK79606	1	MDX-PIO OPS MANUAL	ZG:	REV (12-79) 2083810
MK79639	1	MDX-FLOPPY OPS MANUAL	ZH:	REV (12-79) 2083810
MK78557	1	FLP-80 DOS OPS MANUAL	ZI:	REV (01-80) 2083810
MK79668	1	FLP-80 DOS/MDX MANUAL	ZJ:	REV (05-79) 2083810
MK78515	1	Z-80 PROGRAMMING MANUAL	ZK:	REV (01-78) 2083810
MK79635	1	MACRO 80 V2.1 OPS MANUAL	ZL:	REV (01-79) 2083810
MK78516	1	MICRO-REFERENCE MANUAL	ZM:	REV (02-78) 2083810
MK79859	1	SERVICE CENTER POLICY	ZN:	2083810
MK79925	1	ERRATA SHEET-PIP V.2.2	ZO:	2083810
MK79912	1	ERRATA SHEET MDX PIO	ZP:	2083810
MK79858	1	ERRATA SHEET MDX-CPU1	ZQ:	2083810
MK79849	1	ERRATA SHEET EPROM/UART	ZR:	2083810
MK79928	1	ERRATA SHEET MDX-FLP	ZS:	2083810
MK79976	1	ERRATA SHEET MDX-DRAM32A	ZT:	2083810
4200209	1	FLP-80 DOS V2.2 DISKETTE	ZU:	2083810
4600056	1	POWER CORD U.S.	ZV:	2083810
5013004	6	MD SIZE ANTI-STATIC BAGS	ZW:	2083810
5025974	1	BOX W/FOAM PACKING.	ZX:	2083810

PARTS LIST, MATRIX 80/SDT 64K, 50Hz

P/N	QTY.	DESCRIPTION	ITEM NO.	DRAWING NO.	
0000000	* MATRIX 80-SDT TOP ASSY *				
0000001	PART LIST MATRIX 80/SDT		A		
0000002	TOP ASSY. SUB ASSYs NOTED		B		
0000003	BY PART # STARTING W/ 20.		C		
0000004	SEE P/L FOR SUBASSY FOR		D		
0000005	ADDITIONAL PARTS.		E		
0000006	QTY UT	PART DESCRIPTION ITEM#	F	DRAWING NO.	ASSY.
0000007		TOP ASSY.MATRIX 80/SDT	G	450-00838-11 REV A	2083811
0000008		SCHEMATIC MATRIX 80/SDT	H	450-00839-00 REV A	2083811
2073400	1	FRAME ASSY	1	450-00734-00 REV B	2083811
5025375	1	LABEL,P.C.B. LOCATOR	2	450-00920-00 REV A	2083811
2054900	1	PANEL ASSY,REAR	3	450-00549-00 REV A	2083811
2084800	1	PANEL ASSY,I/O	4	450-00848-00 REV A	2083811
4140323	1	BEZEL	5	450-00440-00 REV C1	2083811
4280899	8	BALL STUD	6		2083811
4140326	1	TOP SKIN	7	450-00443-00 REV C1	2083811
2063812	1	ASSY, DISC DRIVE	8	450-00638-12 REV A	2083811
2083700	1	PWR. SUPPLY ASSY. CP237A	9	450-00837-00 REV A1	2083811
2066610	1	CARD CAGE ASSY	10	450-00666-10 REV A	2083811
4210339	13	SCREW,#6-32 X 3/8 PPH	11		2083811
4210095	3	CLAMP,CABLE	12		2083811
4210348	8	WASHER,#6 EXT TOOTH	13		2083811
4210346	3	SCREW,#8-32 X 1/2 PPH	14		2083811
4210351	3	WASHER,#8 FLAT	15		2083811
4210349	3	WASHER,#8 EXT TOOTH	16		2083811
4210350	8	WASHER,#6 FLAT	17		2083811
4210362	2	CLAMP,CABLE 1/4"	18		2083811
2079300	1	FRONT PANEL ASSY	19	450-00793-00 REV C	2083811
4280525	2	SCREW,#4-40 X 3/8 PPH	20		2083811
4210347	5	SCREW,#6-32X7/16 PPH BO	21		2083811
5025979	1	LABEL,MFG LOGO	22	450-00621-00 REV A	2083811
2047311	1	MDX FLP	23	450-00473-11 REV A	2083811
2035813	1	MDX CPU1 SUBASSY	24	450-00358-13 REV A	2083811
2036118	1	MDX DRAM 32A SUBASSY	25	450-00361-18 REV A	2083811
2036119	1	MDX DRAM 32A SUBASSY	26	450-00361-19 REV A	2083811
2036715	1	MDX EPROM UART	27	450-00367-15 REV A	2083811
2037015	1	MDX PIO	28	450-00370-15 REV A	2083811
4510038	1	FUSE,5x20 FUSE 1.5A	29		2083811
4510032	1	INSERT,5x20 FUSE	30		2083811

PARTS LIST, MATRIX 80/SDT 64K, 50Hz

P/N	QTY.	DESCRIPTION	ITEM NO.	DRAWING NO.
7000000		THIS IS THE PACK LIST FOR THE	ZA:	ITEMS WITH DESIGNATOR
7000001		MATRIX 80/SDT.	ZB:	(:)ARE SHIPPED W/PROD
MK79899	1	MATRIX 80/SDT CPS. MAN.	ZC:	REV (2-81) 2083811
MK79612	1	MDX-CPU1 OPS MANUAL	ZD:	REV (12-78) 2083811
MK79624	1	MDX-DRAM OPS MANUAL	ZE:	REV (08-80) 2083811
MK79604	1	MDX-EPROM/UART OPS MAN.	ZF:	REV (01-80) 2083811
MK79606	1	MDX-PIO OPS MANUAL	ZG:	REV (12-79) 2083811
MK79639	1	MDX-FLOPPY OPS MANUAL	ZH:	REV (12-79) 2083811
MK78557	1	FLP-80 DOS OPS MANUAL	ZI:	REV (01-80) 2083811
MK79668	1	FLP-80 DOS/MDX MANUAL	ZJ:	REV (05-79) 2083811
MK78515	1	Z-80 PROGRAMMING MANUAL	ZK:	REV (01-78) 2083811
MK79635	1	MACRO 80 V2.1 CPS MANUAL	ZL:	REV (01-79) 2083811
MK78516	1	MICRO-REFERENCE MANUAL	ZM:	REV (02-78) 2083811
MK79869	1	SERVICE CENTER POLICY	ZN:	2083811
MK79925	1	ERRATA SHEET-PIP V.2.2	ZO:	2083811
MK79912	1	ERRATA SHEET MDX PIO	ZP:	2083811
MK79858	1	ERRATA SHEET MDX-CPU1	ZQ:	2083811
MK79849	1	ERRATA SHEET EPROM/UART	ZR:	2083811
MK79928	1	ERRATA SHEET MDX-FLP	ZS:	2083811
MK79976	1	ERRATA SHEET MDX-DRAM32A	ZT:	2083811
4200146	2	FLP-80 DOS V2.1 DISKETTE	ZU:	REV (12-80) 2083811
4600056	1	POWER CORD U.S.	ZV:	2083811
4600156	1	POWER CORD EURO CONN.	ZV::	2083811
5013004	6	MD SIZE ANTI-STATIC BAGS	ZW:	2083811
5025974	1	BOX W/FOAM PACKING.	ZX:	2083811

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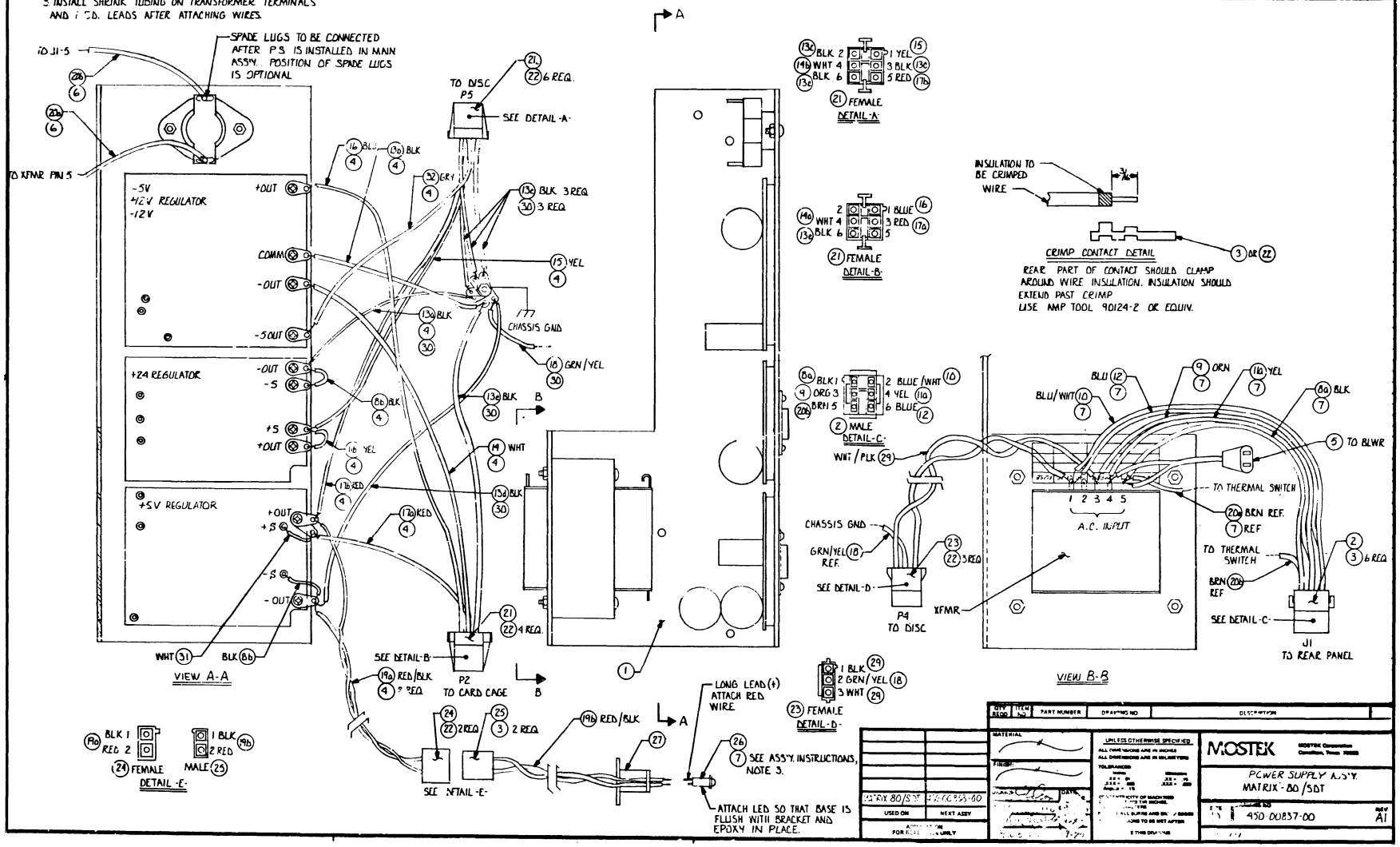
NOTES: 1. FOR PARTS LIST REFER TO DWG. NO. 950-20837-00
2. DETAIL VIEWS OF CONNECTORS ARE FROM WIRESIZE.
3. INSTALL SHRINK TUBING ON TRANSFORMER TERMINALS AND 7 S.D. LEADS AFTER ATTACHING WIRES.

LTR	DESCRIPTION	APPD	DATE
A			
A1	INC PER ECN NO. SE111002	PEDG	



QTY REQD	ITEM NO	PART NUMBER	DRAWING NO	DESCRIPTION

MATERIAL
FINISH
UNLESS OTHERWISE SPECIFIED
DATE

MATRIX 80/SDT
USED ON
NEXT ASSY

MOSTEK
POWER SUPPLY ASSY. MATRIX-80/SDT
DWG NO 950 00837-00
REV A1

TRANSFORMER CONNECTIONS

REVISION				
LTR		DESCRIPTION	APPD	DATE
A				
A1				

WIRE LIST				
ITEM NO.	DESCRIPTION	LENGTH IN.	P/N	QTY.
8a	WIRE 20 AWG., BLK	10	4600161	1
8b	BLK	2	4600161	2
9	ORN	10	4600162	1
10	BLU/WHT	10	4600174	1
11a	YEL	10	4600170	1
11b	YEL	2	4600170	1
12	20 AWG., BLU	10	4600175	1
13a	16 AWG., BLK	13.5	4600169	2
13b		11.5		1
13c		7.5		3
13d		19.5		1
13e	BLK	25.5	4600169	1
14	WHT	17	4600168	1
15	YEL	18	4600105	1
16	BLU	20	4600166	1
17a	RED	13.5	4600167	1
17b	16 AWG. RED	15	4600167	1
18	20 AWG. GRN/YEL	6	4600173	1
19a	TW. PR., BLK/RED	7	4600200	1
19b	TW. PR., BLK/RED	29	4600200	1
20a	BRN	11	4600160	1
20b	BRN	15	4600160	1
29	TW. PR., WHT/BLK	12	4600202	1
31	RED	2	4600172	1
32	20 AWG. GRAY	16	4600171	1

TRANSFORMER CONNECTIONS

1. WHT (29)
   WHT/WHT (10)
   BLU (12)
2. NONE
3. BLK (29)
   ORN (9)
4. YEL (11a)
   BLK (5) BLWR
5. BRN (20a)
   BLK (8a)
   BLK (5) BLWR

SIZE D — DRAWING NO 450-00837-00
SCALE

PARTS LIST, POWER SUPPLY ASSEMBLY

PIN	QTY.	DESCRIPTION	ITEM NO.	DRAWING NO.
0000000		PARTS LIST FOR THE POWER	A:	
0000001		SUPPLY SUB ASSEMBLY USED	B:	
0000002		ON THE MATRIX 80/SDT	C:	
0000003	QTY UT	PART DESCRIPTION	ITEM #	DRAWING NUMBER
0000004		ASSY. DRAWING	00:	460-00837-00 REV A
4200186	1	POWER SUPPLY CP237A	1	
4210091	1	CONN. 6 CONTACT,MALE	2	
4280067	8	CONTACT MALE PIN	3	
4210311	11	TERMINAL #6 SOLDER	4	
4600154	1	CORD,POWER FAN	5	
4620074	2	SPADE LUG, CRIMP	6	
4600159	2 IN	SHRINK TUBING 3/16	7	
4600161	10 IN	WIRE,20 AWG BLACK	8	
4600162	10 IN	WIRE,20 AWG ORANGE	9	
4600174	10 IN	WIRE,20 AWG BLUE/WHITE	10	
4600170	12 IN	WIRE,20 AWG YELLOW	11	
4600175	10 IN	WIRE,20 AWG BLUE	12	
4600169	82 IN	WIRE,16 AWG BLACK	13	
4600168	33 IN	WIRE,16 AWG WHITE	14	
4600105	18 IN	WIRE,16 AWG YELLOW	15	
4600166	20 IN	WIRE,16 AWG BLUE	16	
4600167	37 IN	WIRE,16 AWG RED	17	
4600173	6 IN	WIRE,20 AWG GRN/YEL	18	
4600200	28 IN	WIRE,20 AWG TWPR BLK/RD	19	
4600160	21 IN	WIRE,20 AWG BROWN	20	
4210078	2	CONN. 6 CONTACT,FEMALE	21	
4620075	15	CONTACT SOCKET	22	
4210077	1	CONN. 3 CONTACT,FEMALE	23	
4210094	1	CONN. 1 CONTACT,FEMALE	24	
4210096	1	CONN. 2 CONTACT,MALE	25	
4240020	1	DIODE,LED RED	26	
4140296	1	BRKT,PWR ON INDICATOR	27	
4410035	AR	TIE CABLE	28	(AS REQUIRED)
4600202	12 IN	WIRE,20 AWG TWPR BLK/WT	29	
4210312	6	TERMINAL #8 SOLDER	30	
4600149	2 IN	WIRE,24 AWG WHITE	31	

SCHEMATIC, MDX-PIO/PPG SCRAMBLER

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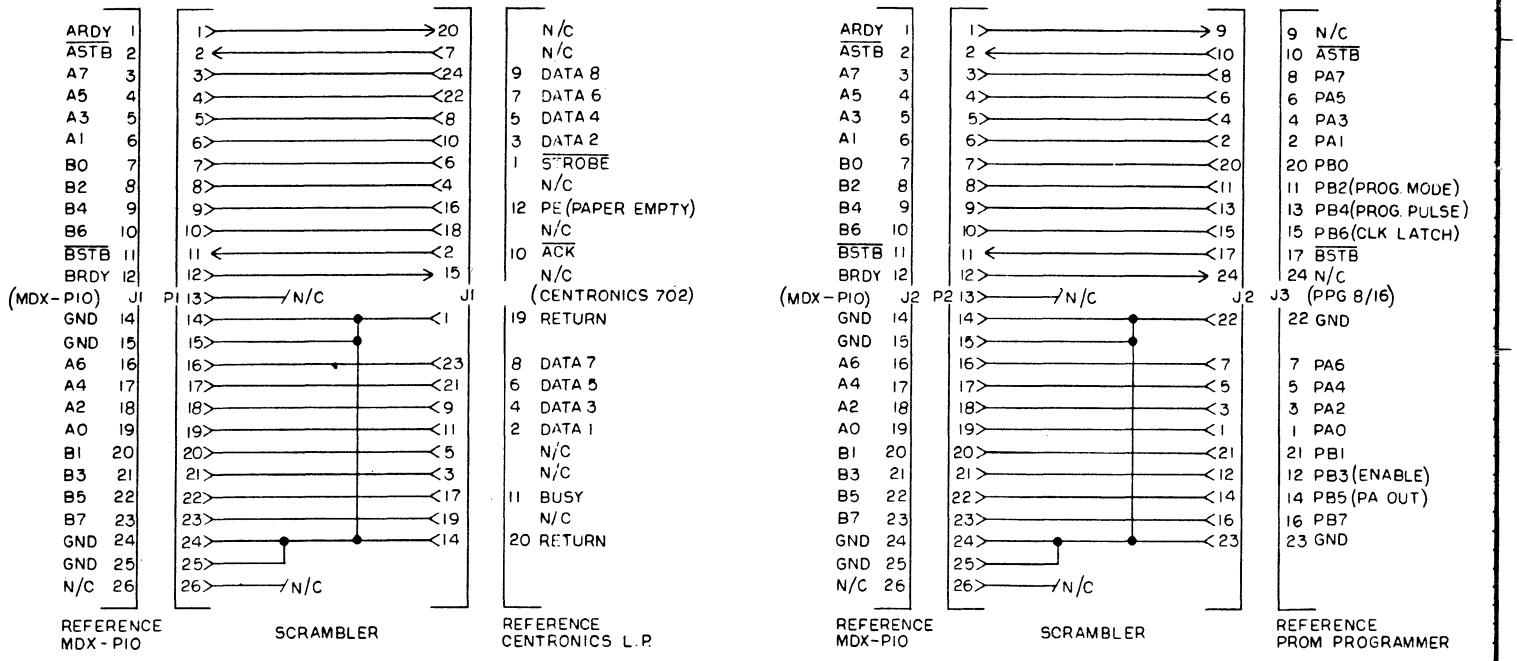
NOTES:

REVISIONS				
LTR		DESCRIPTION	APPD	DATE
A		RELEASED		



QTY REQD	ITEM NO	PART NUMBER	DRAWING NO	DESCRIPTION

MATRIX-B3/[illegible]T
MK 78197
USED ON | NEXT ASSY
APPLICATION FOR REFERENCE ONLY

MATERIAL
FINISH

UNLESS OTHERWISE SPECIFIED
ALL DIMENSIONS ARE IN INCHES
ALL DIMENSIONS ARE IN MILLIMETERS
TOLERANCES
Inches: XX ± .01, XXX ± .005, Angular ± 1%
Millimeters: XX ± .15, XXX ± .030
CONCENTRICITY OF MACHINED DIAMETERS .002 TIR INCHES (0.15 TIR MILLIMETERS)
REMOVE ALL BURRS AND SHARP EDGES
ALL DIMENSIONS TO BE MET AFTER PLATING
DO NOT SCALE THIS DRAWING

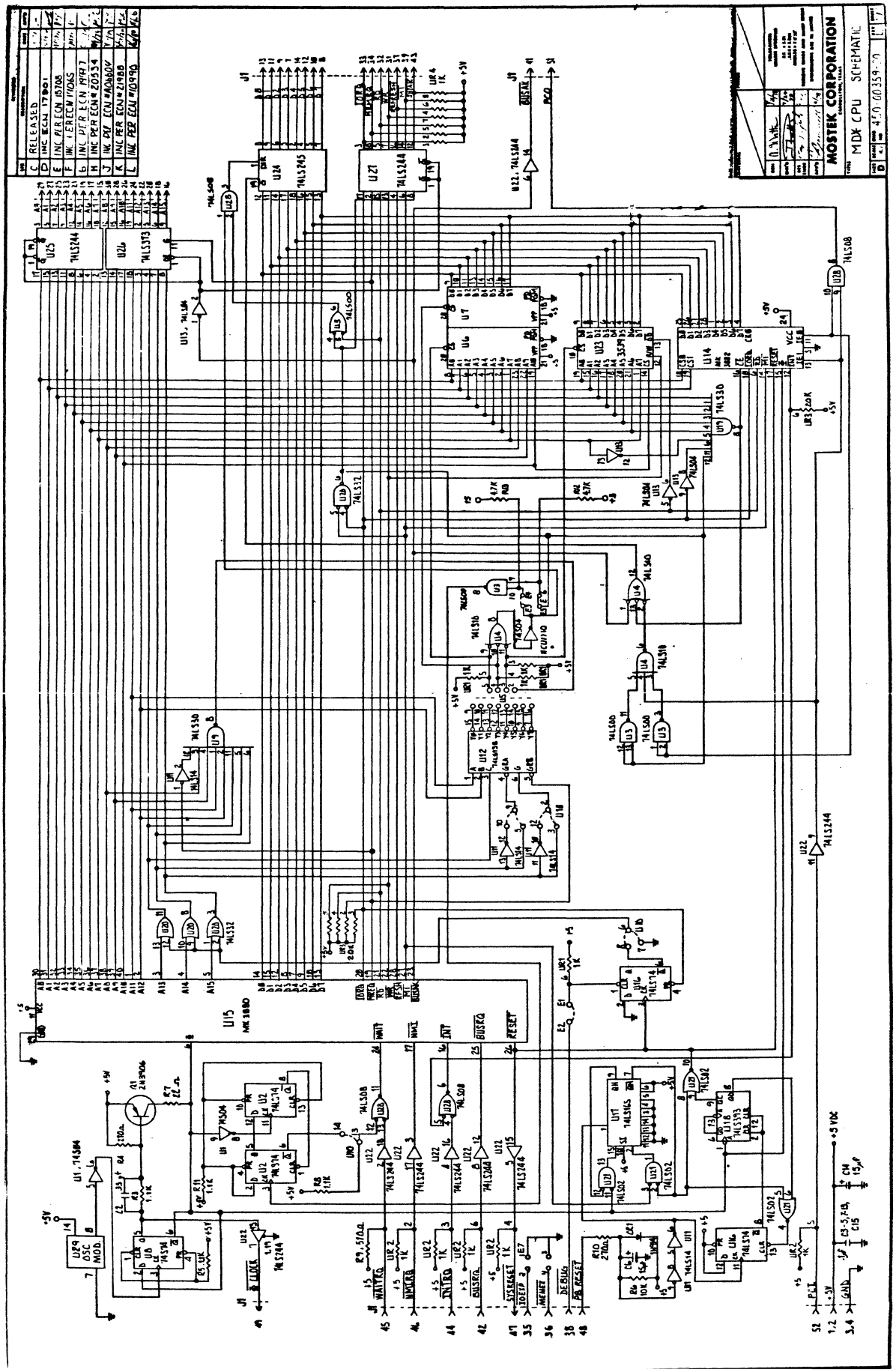
DRAWN [illegible] 2-5-80
CHK'D [illegible]
ENG APPR [illegible]
MFG APPR [illegible]

MOSTEK
MOSTEK Corporation
Carrollton, Texas 75006

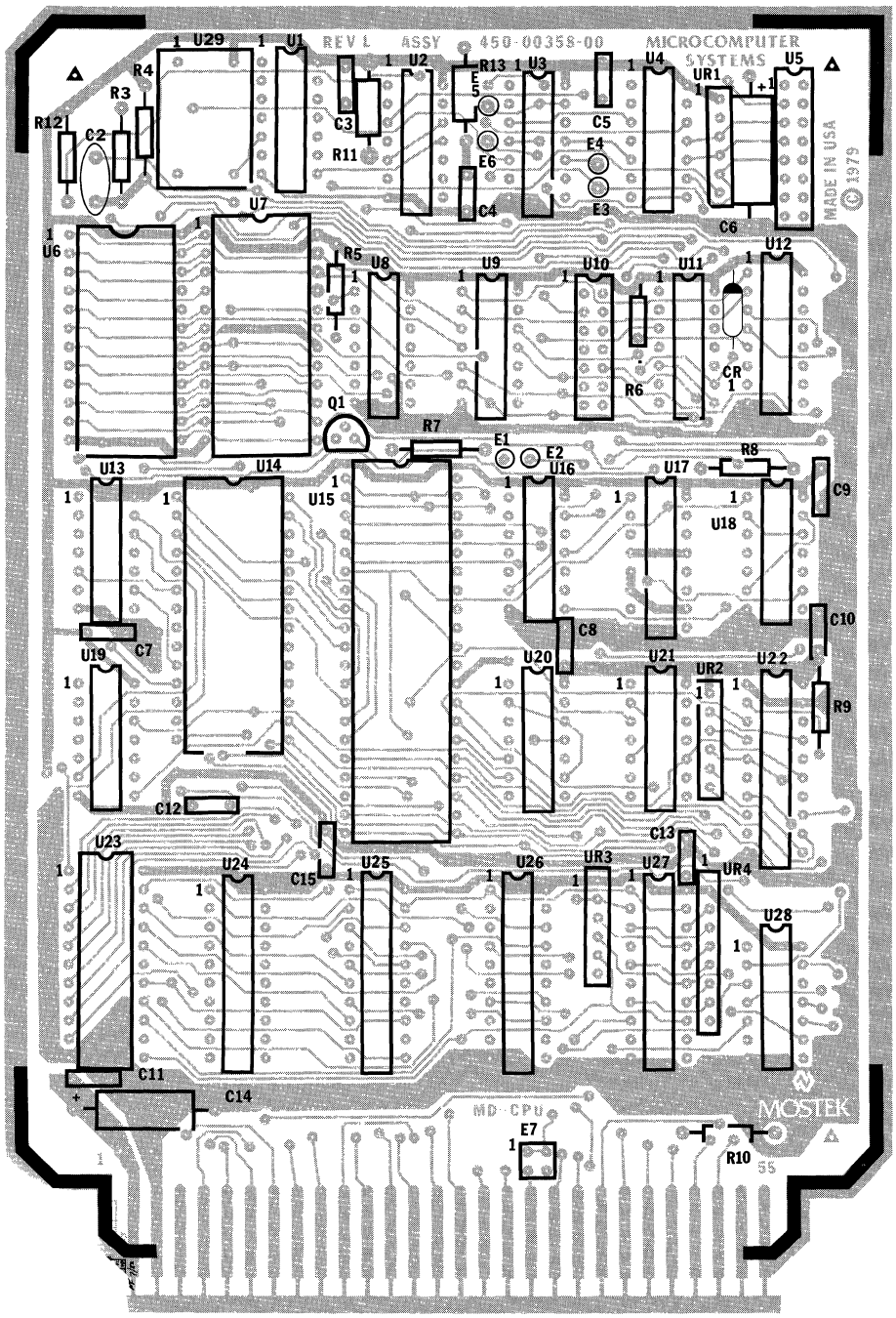
SCHEMATIC,
MDX-PIO/PPG SCRAMBLER

SIZE C | DRAWING NO 450-00868-00 | REV A
SCALE | SHEET 1 OF 1

SCHEMATIC, MDX-CPU1



PARTS PLACEMENT, MDX-CPU1

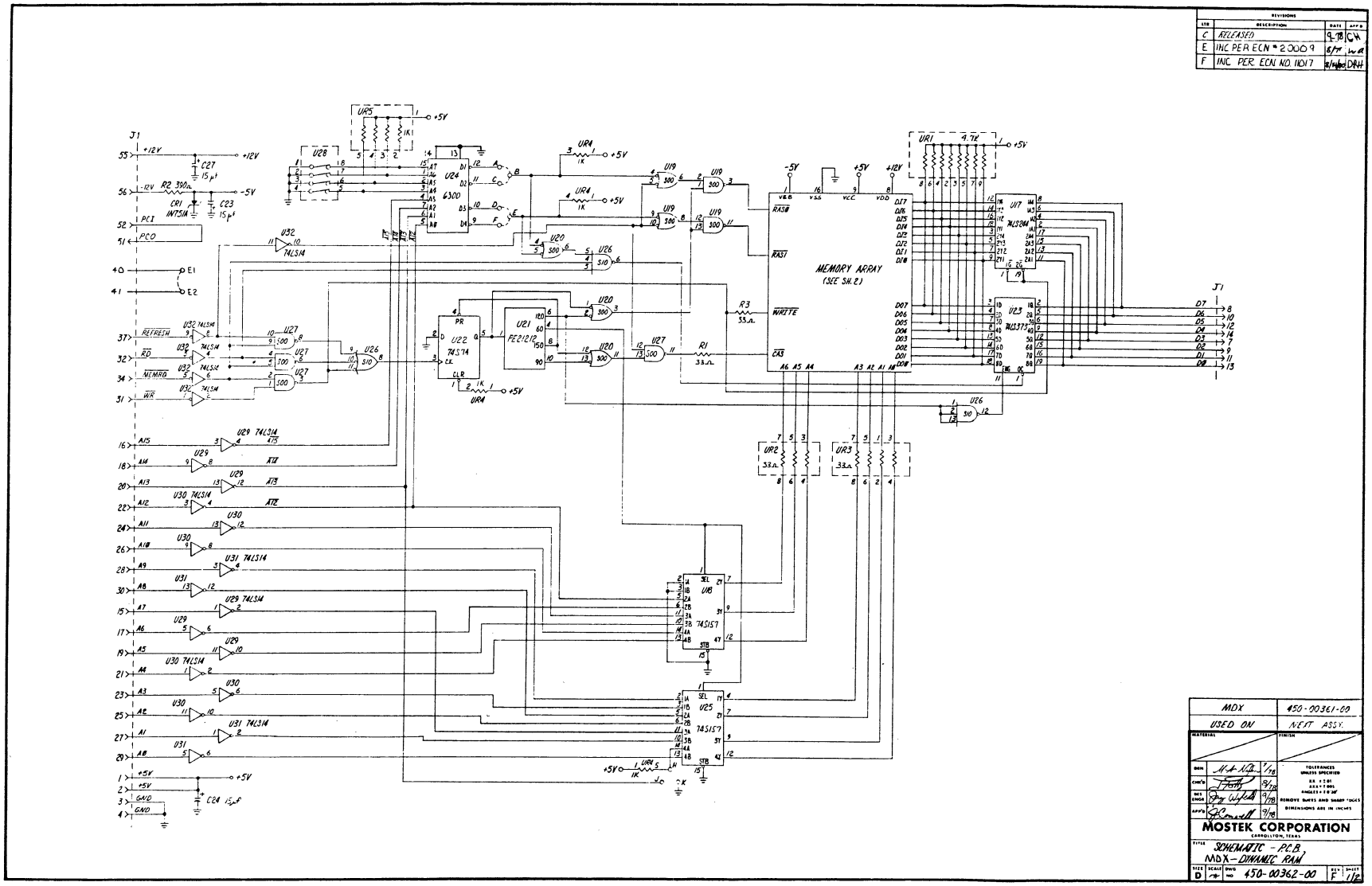


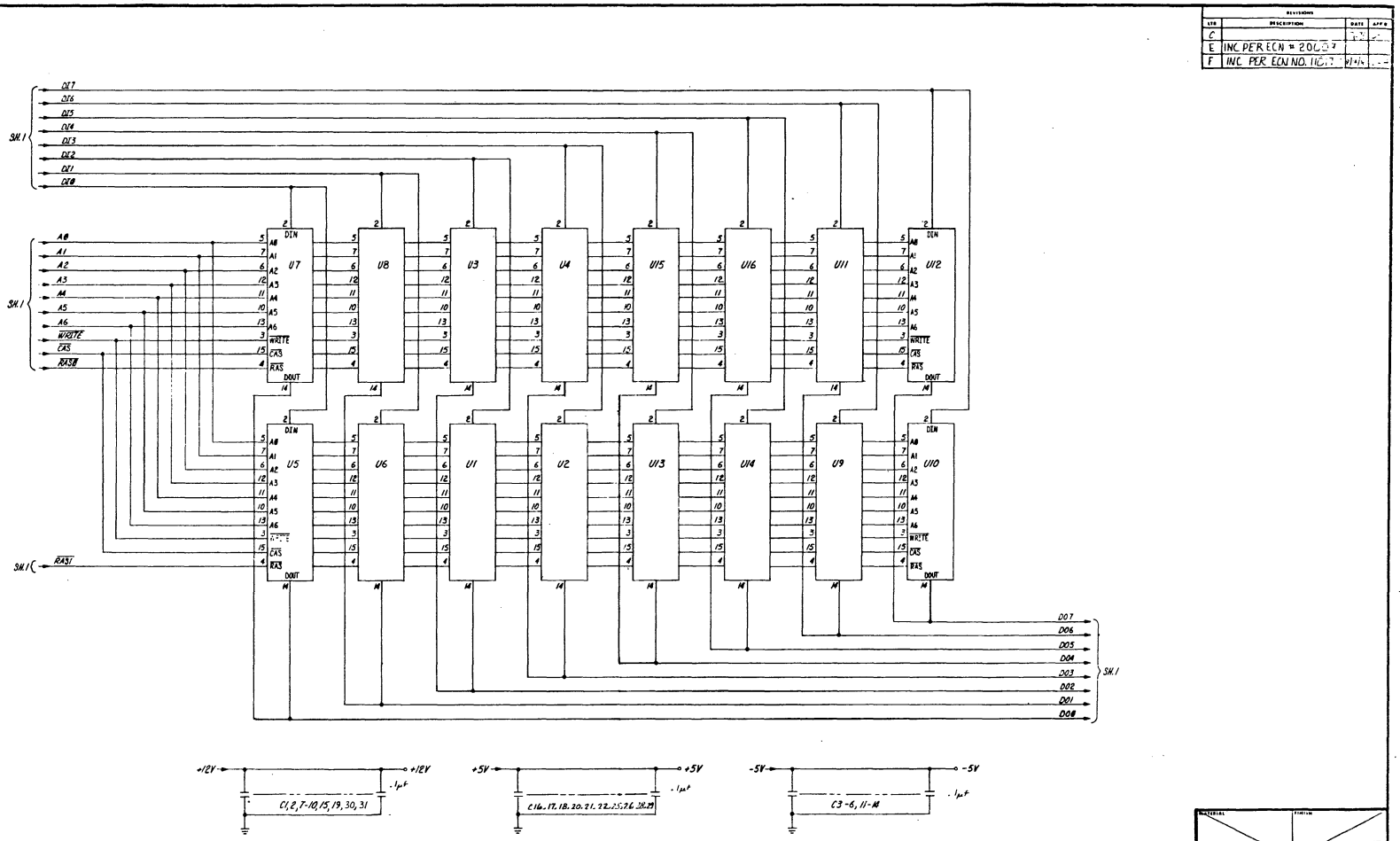
PARTS LIST, MDX-CPU1

USED ON SUBASSY, 2035812 OR 2035813

PIN	QTY.	DESCRIPTION	ITEM NO.	DRAWING NO.
000000	QTY	PARTS LIST FOR THE MDX-	AA:	
0000001		CPU1 SUBASSY. USED ON	AB:	
0000002		THE MATRIX 80/SDT.	AC:	
4610110	1	P.C. BOARD, FAB DRWG.	AD:	450-00357-10 REV K
0000004		ASSEMBLY CPU1	AE:	450-00358-12 REV A
0000005		SCHEMATIC CPU1	AF:	450-00359-00 REV K
4150086	1	CAP 33PF MICA 5% .234"	C2	
4150111	11	CAP .1UF CER 20% .2"	C3-5,7-13,15	
4150140	2	CAP 15UF AX LEADS 10%	C6,14	
4480026	1	DIODE 1N914	CR1	
4210383	6	HEADER PIN	E1-6	
4210238	1	HEADER 4 PIN	E7	
4480011	1	TRANSISTOR 2N3906	Q1	
4470089	2	RES 4.7 K OHMS	R12,13	
4470074	4	RES 1.1K	R3,5,8,11	
4470059	2	RES 270 OHMS	R4,10	
4470097	1	RES 10K	R6	
4470033	1	RES 22 OHMS	R7	
4470066	1	RES 510 OHMS	R9	
4313285	1	IC 74S04	U1	
4313291	1	IC 74LS14	U11	
4313296	1	IC 74LS138	U12	
4313288	1	IC 74LS04	U13	
4313269	1	IC MK3882	U14	
4313271	1	IC MK3880	U15	
4313555	1	IC 74LS165	U17	
4313335	1	IC 74LS393	U18	
4313413	2	IC 74LS74	U2,16	
4313411	1	IC 74LS32	U20	
4313300	1	IC 74LS02	U21	
4313507	3	IC 74LS244	U22,25,27	
4313268	1	IC 35392	U23	
4313508	1	IC 74LS245	U24	
4313544	1	IC 74LS373	U26	
4313289	1	IC 74LS08	U28	
4230019	1	OSCILLATOR MOD. 5 MHZ	U29	
4313287	1	IC 74LS00	U3	
4313301	1	IC 74LS10	U4	
4210143	2	HEADER 16 PIN	U5,10	
4313851	1	IC MK6293 FLP80 PROM	U6	
4313852	1	IC MK6286 FLP80 PROM	U7	
4313266	1	IC 74S74	U8	
4313410	2	IC 74LS30	U9,19	
4470178	2	RES SIP 6PIN 1K	UR1,UR2	
4470299	1	RES SIP 6 PIN 22K	UR3	
4470179	1	RES SIP 8 PIN 1K	UR4	
4620038	1	SOCKET 28 PIN	X14	
4620019	1	SOCKET 40 PIN	X15	
4620037	1	SOCKET 22 PIN	X23	
4620018	2	SOCKET 24 PIN	X6,X7	
4280155	1	EJECTOR	Z	
5025266	1	TRAVELER WIP	Z:NOTE, IN HOUSE ONLY	

SCHEMATIC, MDX-DRAM


REVISIONS
LTR | DESCRIPTION | DATE | APP'D
C | RELEASED | 9-78 | CW
E | INC PER ECN # 20009 | 6/79 | JWR
F | INC PER ECN NO. 11017 | 8/14/80 | DRH
MEMORY ARRAY (SEE SH. 2)
MDX | 450-00361-00
USED ON | NEXT ASSY.
MOSTEK CORPORATION
CARROLLTON, TEXAS
SCHEMATIC - P.C.B.
MDX-DYNAMIC RAM
450-00362-00
F
1/2



MEMORY DECOUPLING

REVISIONS			
LTR	DESCRIPTION	DATE	APP'D
C			
E	INC PER ECN # 2060		
F	INC PER ECN NO. 11[illegible]		

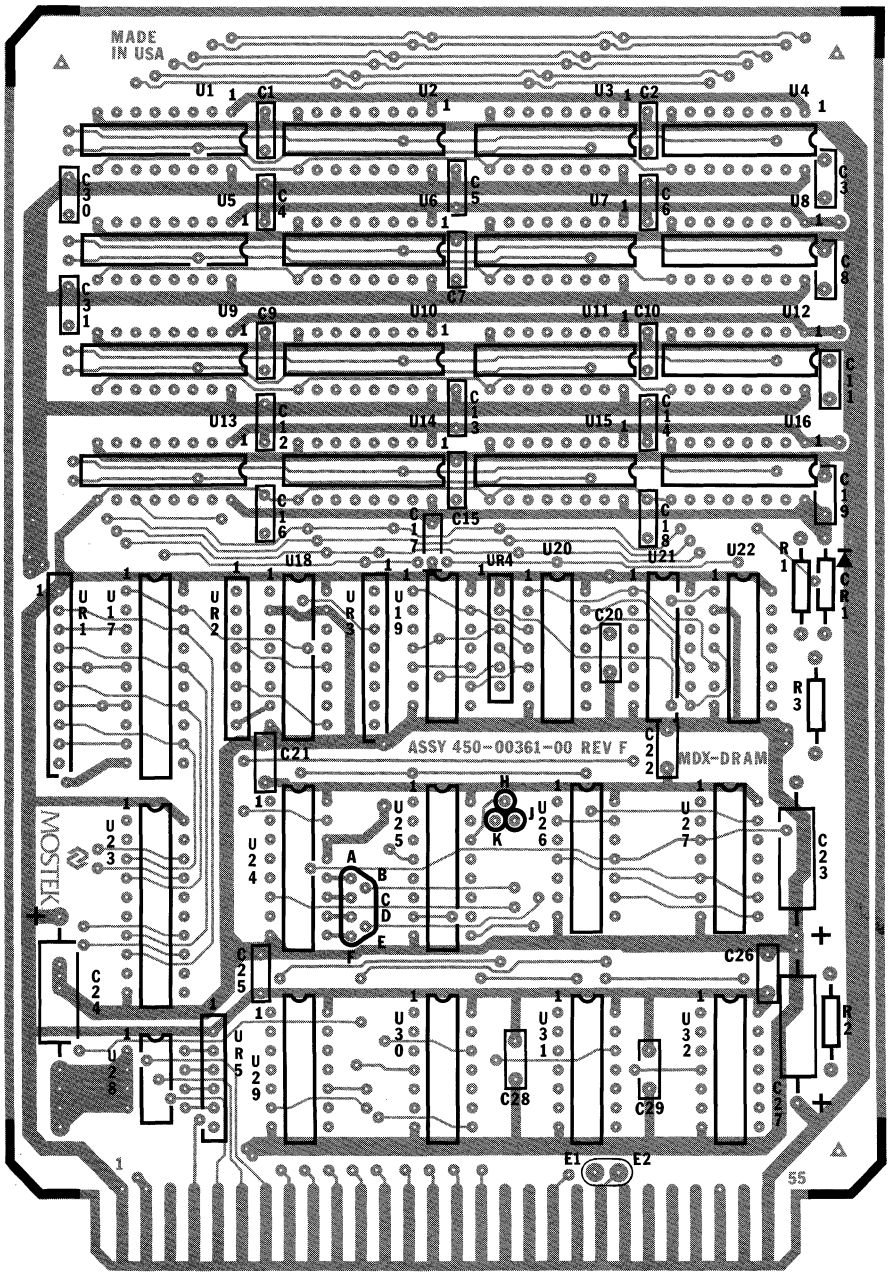
MOSTEK CORPORATION
CARROLLTON, TEXAS

TITLE: SCHEMATIC -ACB, MDX - DRIVER/DRAM

SIZE D | SCALE | F | 2/2

SCHEMATIC, MDX-DRAM

PARTS PLACEMENT, MDX-DRAM



PARTS LIST, MDX-DRAM16

PIN	QTY.	DESCRIPTION	ITEM NO.	DRAWING NO.
0000000		PARTS LIST DRAM-16	AA:	
0000001		SUBASSY USED ON THE	AB:	
0000002		MATRIX 80/SDT/	AC:	
0000003			AC:	
4610113	1	P.C. BOARD FAB DRWG.	AC::	450-00360-10 REV E
0000000		SCHEMATIC	AC::	450-00362-00 REV E
0000005		ASSY. DRWG. DRAM-16	AE:	450-00361-17 REV A
0000004			AE::	
4150111	28	CAPACITOR .1UF	C1-22,25,26,28,29,30,31	
4150140	3	CAPACITOR 15UF	C23,24,27	
4480047	1	DIODE 1N751	CR1	
4210383	11	HEADER STRIP PINS	EA-J,E1,E2	
4470037	2	RES 33 OHMS	R1,3	
4470063	1	RES 390 OHMS	R2	
4313507	1	IC, 74LS244	U17	
4313264	2	IC, 74S157	U18,25	
4313284	3	IC, 74S00	U19,20,27	
4313574	1	IC DELAY LINE 150NS	U21	
4313266	1	IC, 74S74	U22	
4313544	1	IC, 74LS373	U23	
4313579	1	IC MK6268 (MMI6300)	U24	
4313329	1	IC, 74S10	U26	
4640006	1	SWITCH DIP 4 POS	U28	
4313291	4	IC, 74LS14	U29,30,31,32	
4313439	8	IC MK4116-4	U3,4,7,8,11,12,15,16	
4470175	1	RES SIP 10 P. 4.7K	UR1	
4470246	2	RES SIP 8 PIN 33	UR2,3	
4470178	2	RES SIP 6 PIN 1K	UR4,5	
4620017	17	SOCKET 16 PIN	X1-16,X24	
4280155	1	EJECTOR	Z	
5025266	1	TRAVELER WIP	Z:NOTE IN HOUSE USE ONLY	

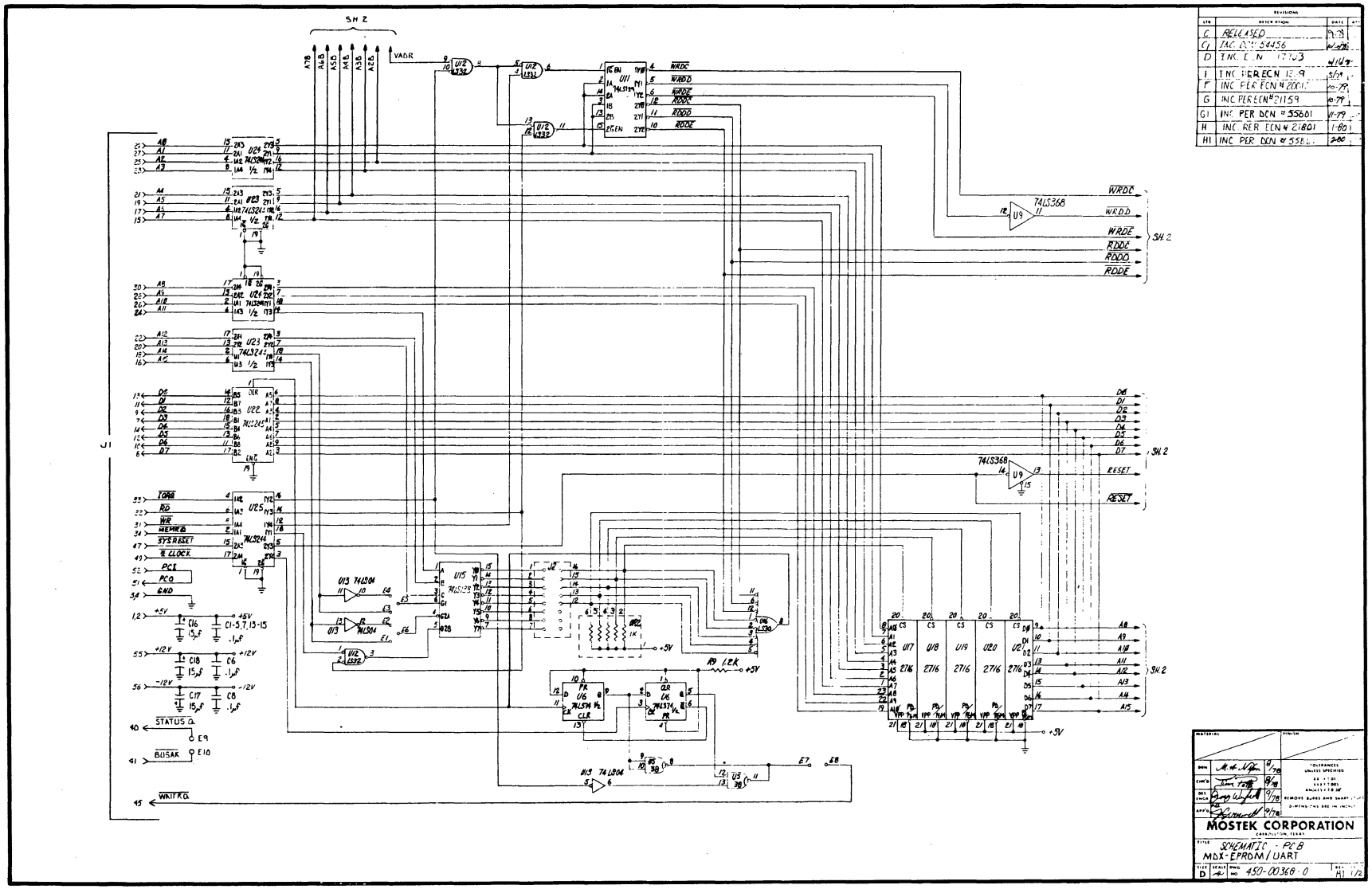
PARTS LIST, MDX-DRAM32A

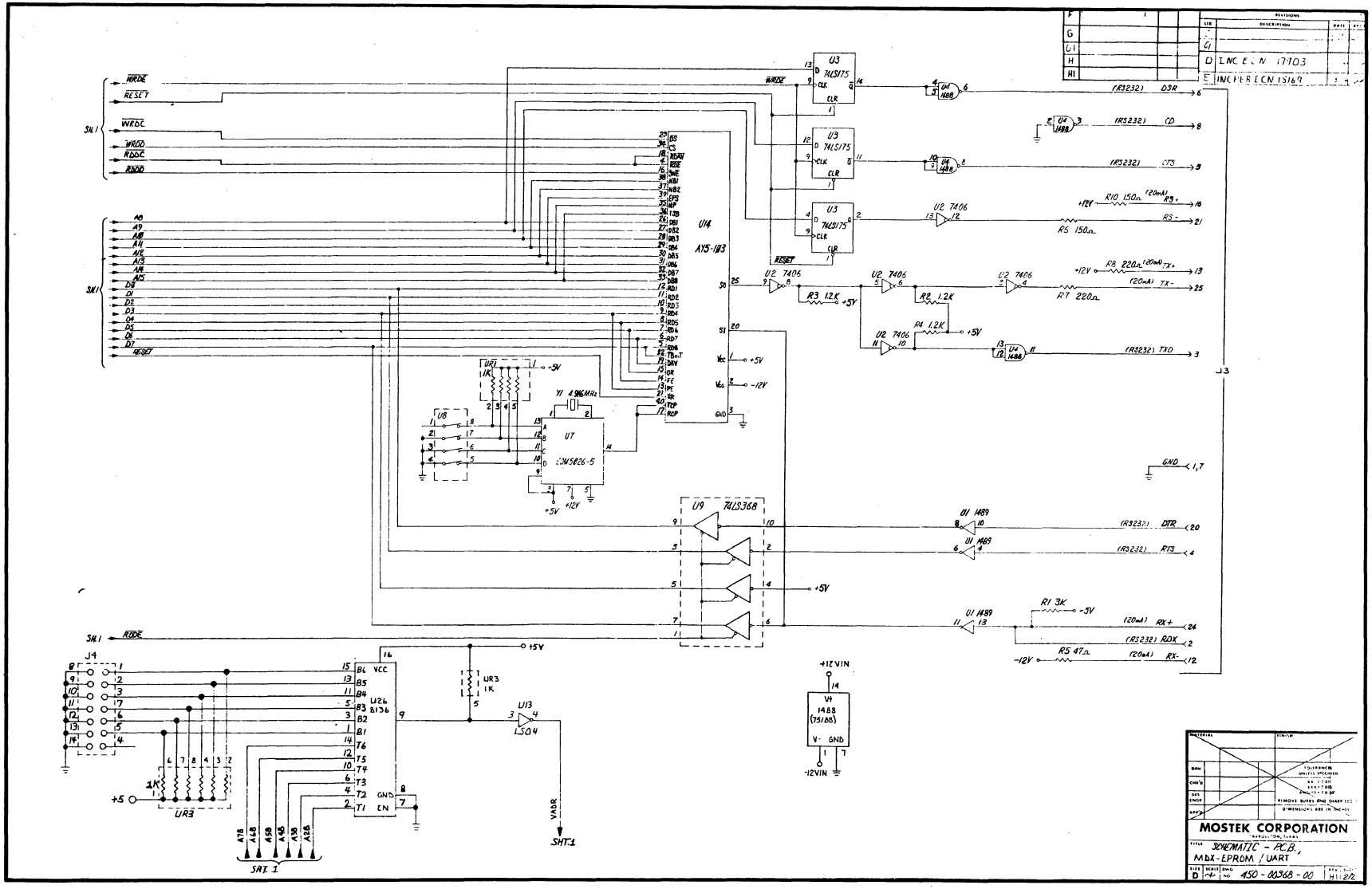
SUBASSY, 2Ø36118 - 2Ø36119

P/N	QTY.	DESCRIPTION	ITEM NO.	DRAWING NO.
4610113	1	P.C.BOARD FAB DRWG.		450-00360-10 REV F
		ASSY. DRWG. MDRAM-32A		450-00361-19 REV A
		SCHM. DRWG. MDRAM-32A		450-00362-00 REV F
4150111	28	CAP 0.1UF		C1-22,25,26,28,29,30,31
4150140	3	CAP 15UF		C23,24,27
4480047	1	DIODE 1N751		CR1
4280007	11	STAKE PIN		EA-J,E1,E2
4470037	2	RES 33 OHMS		R1,R3
4470063	1	RES 390 OHMS		R2
4313439	16	IC MK4116-4		U1-16
4313507	1	IC 74LS244		U17
4313264	2	IC 74S157		U18,25
4313284	3	IC 74S00		U19,20,27
4313574	1	IC DELAY LINE 150NS		U21
4313265	1	IC 74S74		U22
4313544	1	IC 74LS373		U23
4316011	1	IC MK6280 (MMI6300)		U24
4313329	1	IC 74S10		U26
4640006	1	SWITCH DIP 4 POS		U28
4313291	4	IC 74LS14		U29,30,31,32
4470175	1	RES SIP 10 P. 4.7K		UR1
4470246	2	RES SIP 8 PIN 33		UR2,3
4470178	2	RES SIP 6 PIN 1K		UR4,5
4620017	17	SOCKET 16 PIN		X1-16,X24
4280155	1	EJECTOR		Z
5025266	1	TRAVELER WIP		Z:IN HOUSE USE ONLY

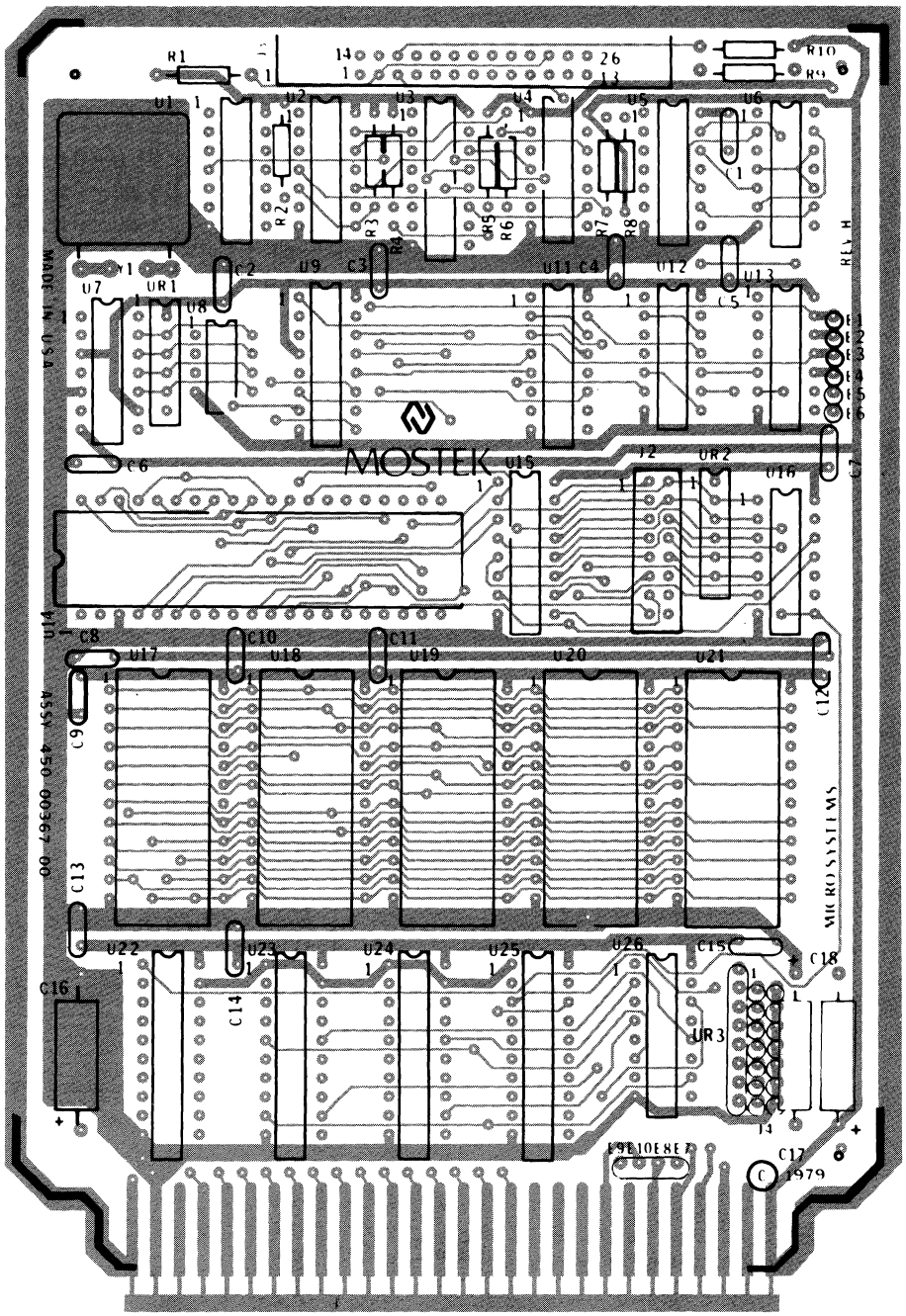
ACCEPTABLE IC SUBSTITUTION

MK4116-4(P/N 4313439) MAY BE REPLACED BY MK4116-3,MK4116-2,
OR MK4116-1


SH 2
VADR
WRDE
WRDD
RDDE
RDDD
RESET
74LS368
2716
+5V
STATUS
BUSAK
WAITRQ
MOSTEK CORPORATION
SCHEMATIC - PCB
MDX-EPROM/UART
450-00368-0

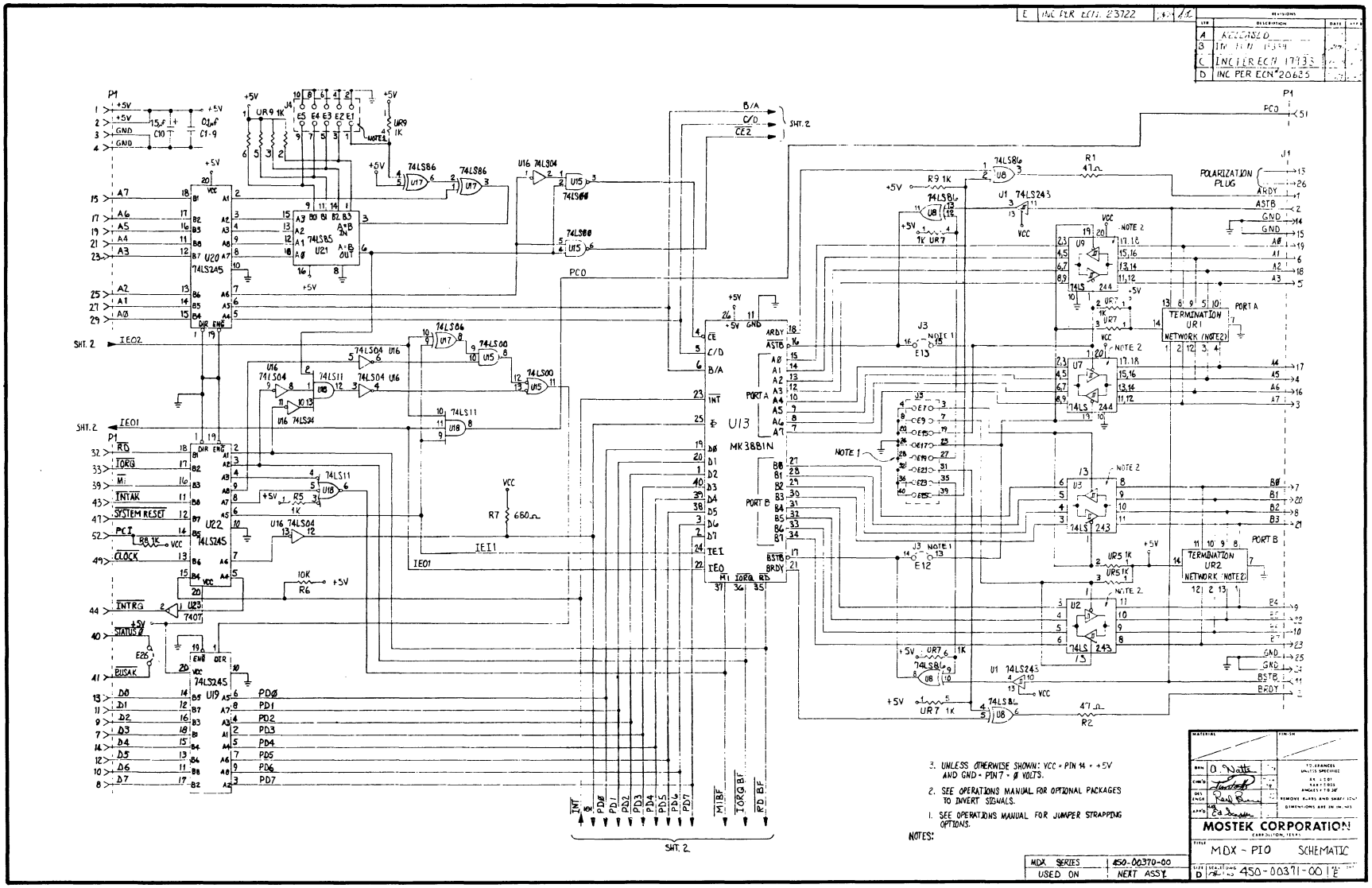

MOSTEK CORPORATION
SCHEMATIC - P.C.B.,
MBX-EPROM / UART
450 - 00368 - 00
U3 74LS175
U4 1488
U2 7406
U14 AY5-1013
U7 COM5026-5
U9 74LS368
U1 1489
U13 LS04
U26 8136
J3
J4
SAT 1
SHT-1
(RS232) DSR
(RS232) CD
(RS232) CTS
(RS232) TXD
(RS232) DTR
(RS232) RTS
(RS232) RDX
(20mA) RX+
(20mA) RX-
(20mA) TX+
(20mA) TX-
RESET
WRDE
RDDE
+5V
-5V
+12V
-12V
GND

PARTS PLACEMENT, MDX-EPROM/UART



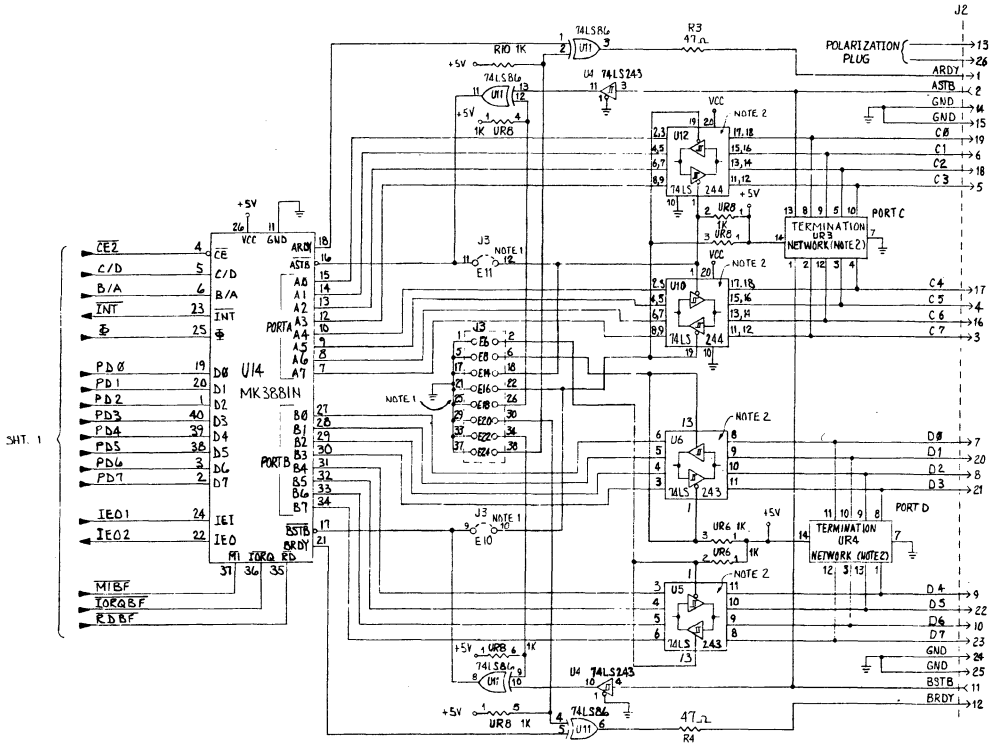
PARTS LIST, MDX-EPROM/UART

PIN	QTY.	DESCRIPTION	ITEM NO.	DRAWING NO.
0000000	QTY	PARTS LIST FOR THE	AA:	
0000001		EPROM UART SUBASSY USED	AB:	
0000002		ON THE MATRIX 80/SDT	AC:	
0000003			AD	
4610111	1	P.C.BOARD FAB DRWG.	AD:	450-00366-10 REV H
0000005		ASSY. DRWG.	AE:	450-00367-15 REV A
0000004		SCHEMATIC MDX EPROM UART	AF:	450-00368-00 REV H1
0000006			AF::	
4150111	15	CAP .1 UF	C1-15	
4150140	4	CAP 15 UF	C16-18	
4210383	10	HEADER STRIP PINS	E1-10	
4210143	1	HEADER 16 PIN	J2	
4210132	1	HEADER 26 PIN R/A	J3	
4210387	1	HEADER 14 PIN	J4	
4470084	1	RES 3K	R1	
4470053	1	RES 150 OHM	R10	
4470075	4	RES 1.2K	R2,3,4,9	
4470041	1	RES 47 OHM	R5	
4470057	3	RES 220 OHM	R6,7,8	
4313258	1	IC 1489/75189	U1	
4313567	1	IC 74LS139	U11	
4313411	1	IC 74LS32	U12	
4313288	1	IC 74LS04	U13	
4313181	1	IC AY-5-1013A	U14	
4313296	1	IC 74LS138	U15	
4313410	1	IC 74LS30	U16	
4313008	1	IC 7406	U2	
4313508	1	IC 74LS245	U22	
4313507	3	IC 74LS244	U23,24,25	
4313637	1	IC DM8136	U26	
4313306	1	IC 74LS175	U3	
4313564	1	IC 1488/75188	U4	
4313078	1	IC 7438	U5	
4313413	1	IC 74LS74	U6	
4313419	1	IC 5026-005	U7	
4640006	1	SWITCH DIP 4 POS	U8	
4313566	1	IC 74LS368	U9	
4470178	2	RES SIP 6 PIN 1K	UR1,2	
4470179	1	RES SIP 8 PIN 1K	UR3	
4620019	1	SOCKET 40 PIN	X14	
4620018	5	SOCKET 24 PIN	X17-21	
4230021	1	CRYSTAL 4.9152 MHZ	Y1	
4280155	1	EJECTOR	Z	
5025266	1	TRAVELER WIP	Z:NOTE IN HOUSE USE ONLY	



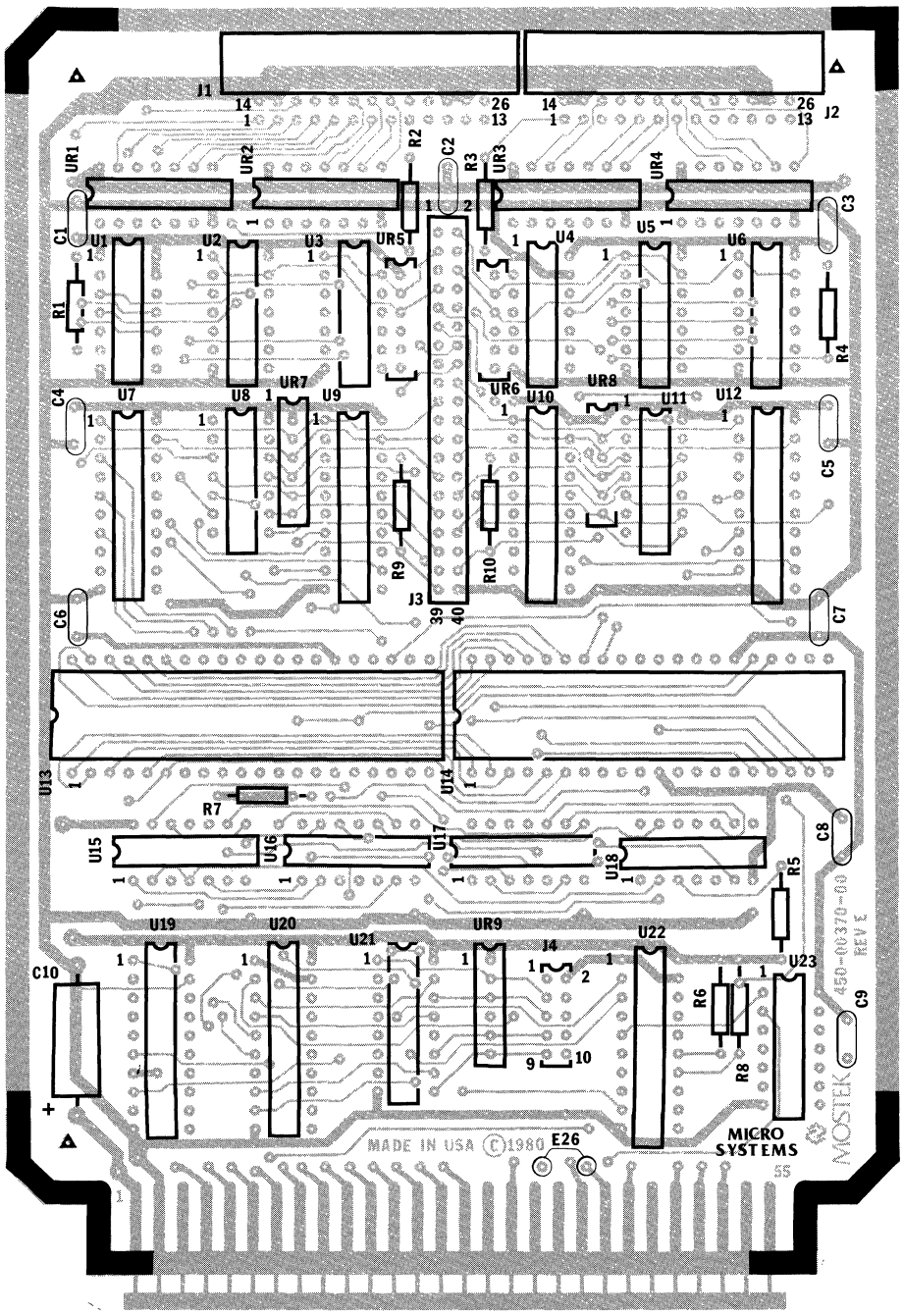
SCHEMATIC, MDX-PIO

REVISIONS			
LTR	DESCRIPTION	DATE	APP'D
A			
B	INC ECN 12384	1/4/84	
C	INC PER ECN 19433	5-1-85	
D			
E			



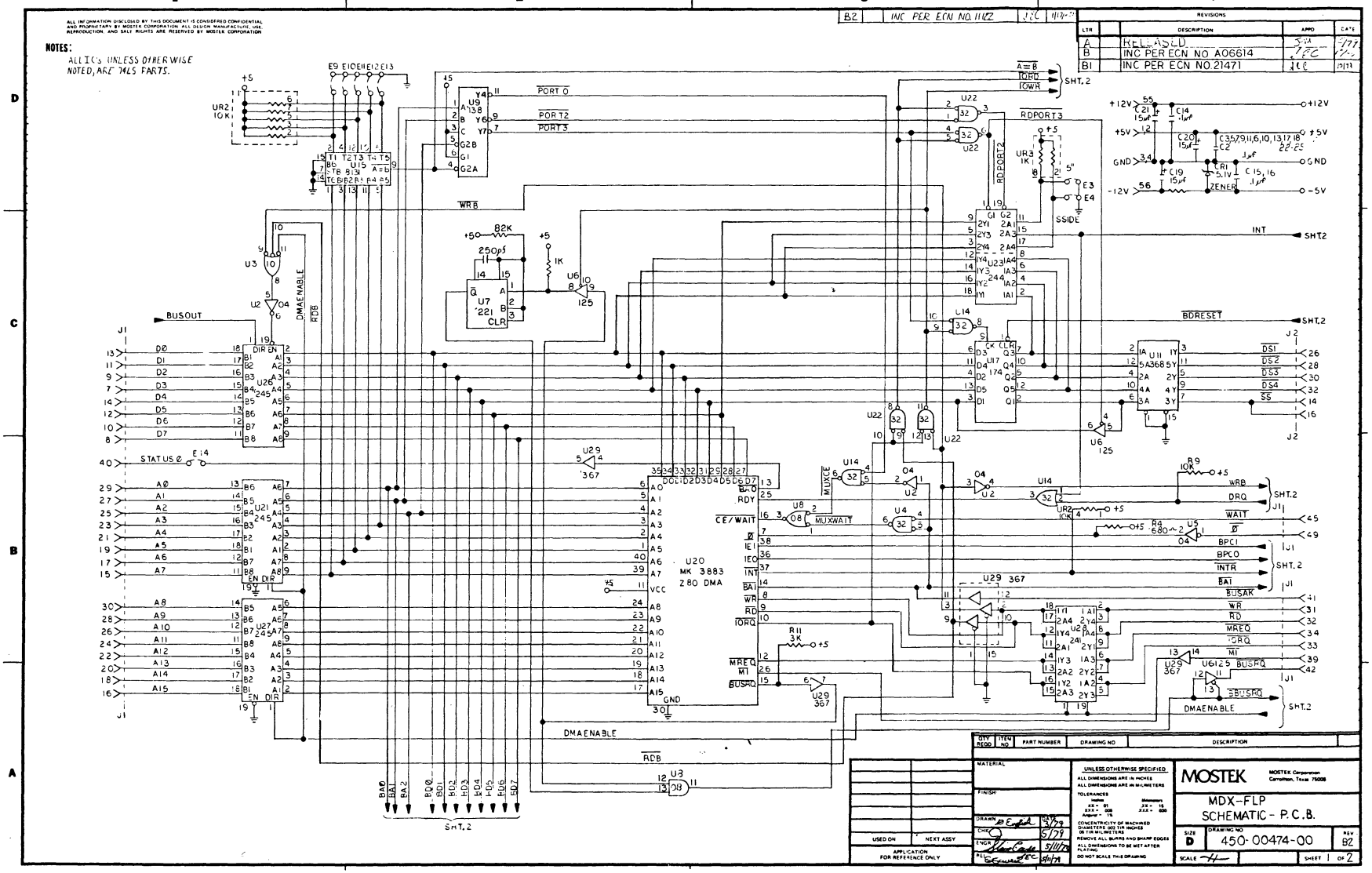
MOSTEK CORPORATION CARROLLTON, TEXAS			
TITLE: MDX-PIO SCHEMATIC			
SIZE: D	SCALE:	DWG NO: 450-00371-00	REV: E SHEET: 2/2

PARTS PLACEMENT, MDX-PIO

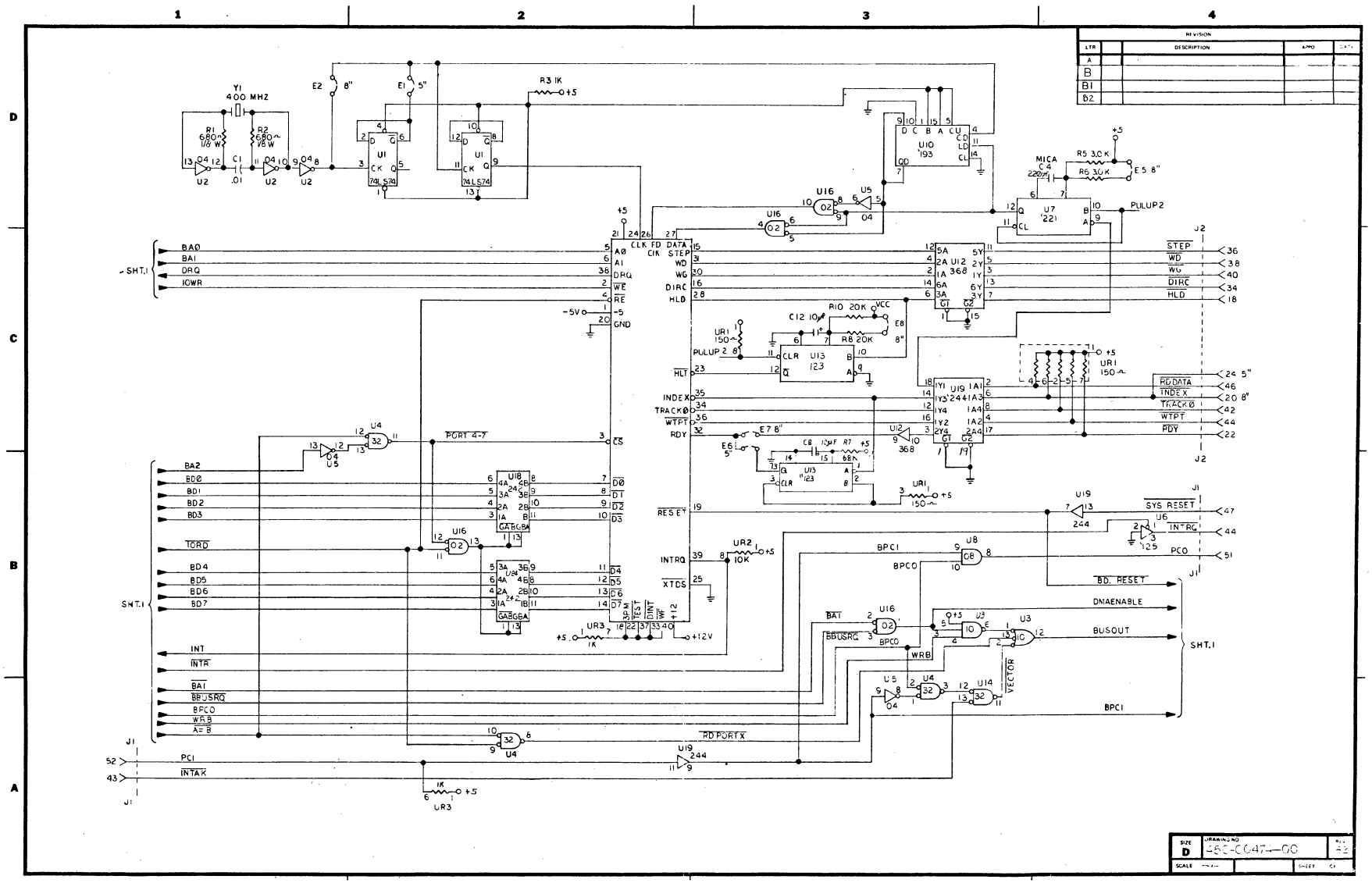


PARTS LIST, MDX-PIO

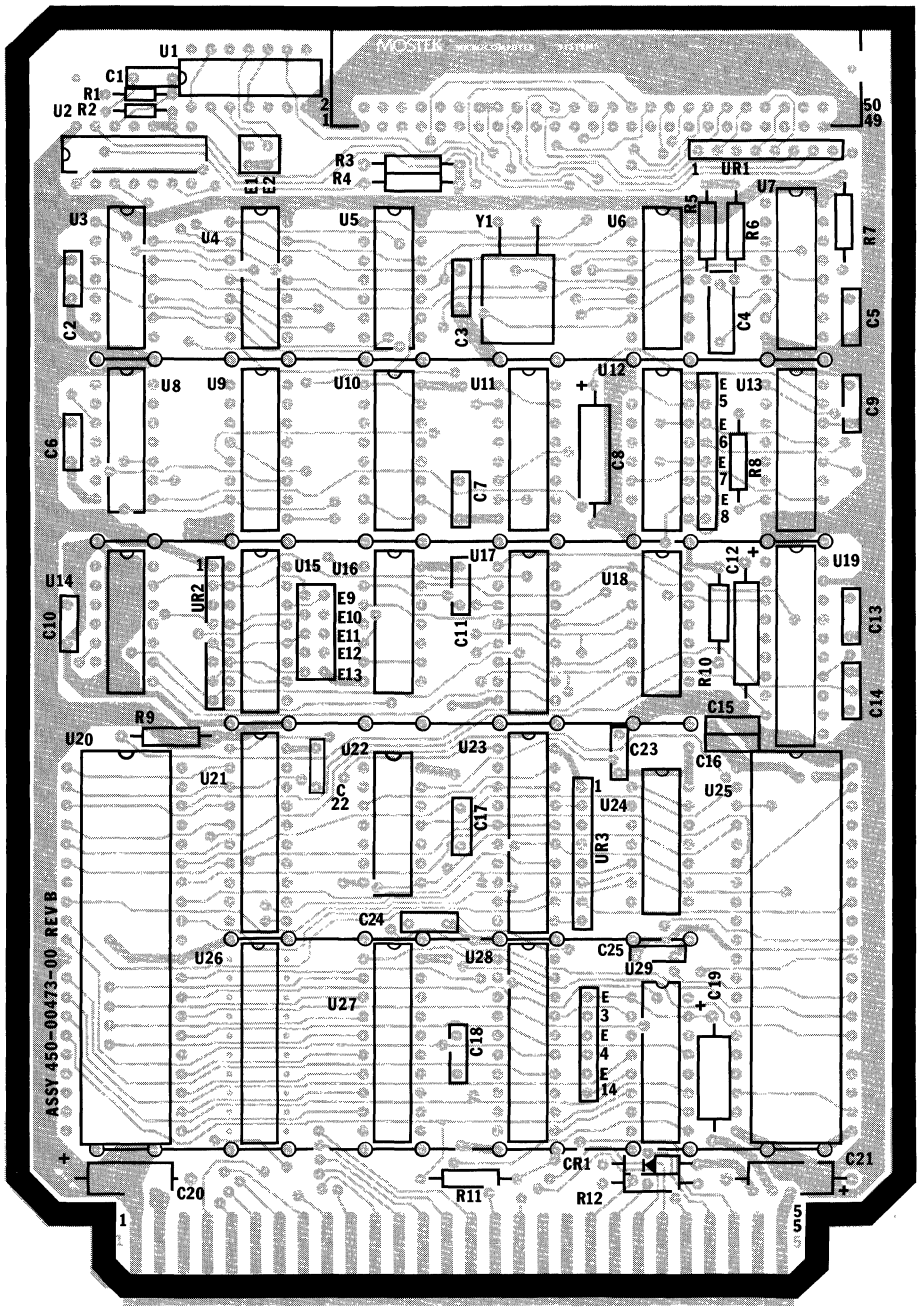
PIN	QTY.	DESCRIPTION	ITEM NO.	DRAWING NO.
0000000		PARTS LIST FOR THE MDX-	AA:	
0000001		PIO SUBASSY USED ON THE	AB:	
0000002		MATRIX 80/SDT	AC:	
0000003			AC::	
0000004		SCHEMATIC	AD:	450-00371-00 REV E
4610114	1	P.C. BOARD FAB DRWG.	AE:	450-00369-10 REV E
0000005		ASSY. DRWG.	AF:	450-00370-15 REV A
0000006			AF::	
4150111	9	CAP .1UF	C1-9	
4150140	1	CAP 15UF 20V	C10	
4280007	1	WIRE WRAP TERMINAL	E26	
4210295	2	HEADER 26 PIN RIGHT <	J1,2	
4210099	1	HEADER 40PIN	J3	
4210144	1	HEADER 10PIN	J4	
4470041	4	RES 47 1/4W 5%	R1-4	
4470073	4	RES 1K 1/4W 5%	R5,8,9,10	
4470097	1	RES 10K 1/4W 5%	R6	
4470069	1	RES 680 1/4W 5%	R7	
4313562	5	IC 74LS243	U1,U3-U6	
4313270	2	IC MK3881N	U13,14	
4313287	1	IC 74LS00	U15	
4313288	1	IC 74LS04	U16	
4313500	1	IC 74LS11	U18	
4313508	3	IC 74LS245	U19,20,22	
4313639	1	IC 74LS242	U2	
4313456	1	IC 74LS85	U21	
4313009	1	IC 7407	U23	
4313507	4	IC 74LS244	U7,9,10,12	
4313417	3	IC 74LS86	U8,11,17	
4470176	2	DIP 14 PIN 1K	UR1-2	
4470178	5	SIP 6 PIN 1K	UR5-9	
4620019	2	SOCKET 40 PIN SOLDER	X13,14	
4620070	4	SOCKET 20 PIN SOLDER	X7,9,10,12	
4620016	10	SOCKET 14 PIN SOLDER	XR1-4,X1-6	
4280155	1	EJECTOR CARD EDGE	Z	
5025266	1	TRAVELER WIP	Z:NOTE IN HOUSE USE ONLY	



SCHEMATIC, MDX-FLP


REVISION
LTR
DESCRIPTION
A
B
B1
B2
Y1
400 MHZ
R1
680
1/8 W
R2
680
1/8 W
C1
.01
U2
U1
74LS74
E2
8"
E1
5"
R3 1K
U10
193
U16
02
U5
04
MICA
C4
220pf
R5 3.0K
R6 3.0K
E5 8"
U7
'221
PULUP2
J2
STEP
WD
WG
DIRC
HLD
U12
368
C12 10µF
R10 20K
VCC
E8
8"
R8 20K
UR1
150
PULUP2 8
U13
123
CLR
HLT
INDEX
TRACK0
WTPT
RDY
U19
'244
RDDATA
INDEX
TRACK0
WTPT
RDY
E7 8"
E6
5"
C8 10µF
R7
68K
RESET
INTRQ
XTDS
UR2
10K
SYS RESET
INTRQ
PCO
J1
BPC1
BPC0
BD. RESET
DMAENABLE
BUSOUT
SHT.1
BAT
BBUSRQ
WRB
VECTOR
U14
BPC1
BA0
BA1
DRQ
IOWR
-SHT.1
-5V
GND
BA2
BD0
BD1
BD2
BD3
PORT 4-7
U18
GABGBA
TORD
BD4
BD5
BD6
BD7
U4
GABGBA
INT
INTA
BAI
BBUSRQ
BPC0
WRB
A=B
PCI
INTAK
RDPORTX
UR3
1K
+12V
+5

PARTS PLACEMENT, MDX-FLP



PARTS LIST, MDX-FLP

PIN	QTY.	DESCRIPTION	ITEM NO.	DRAWING NO.
0000000	QTY	PARTS LIST FOR THE MDX-	AA:	
0000001		FLOPPY SUBASSY. USED ON	AB:	
0000002		THE MATRIX 80/SDT UNIT.	AC:	
4610136	1	PC BOARD FAB DRWG.	AD:	450-00472-00 REV B1
0000004		ASSY. DRWG. FLOPPY BRD	AE:	450-00473-11 REV A
0000005		SCHEMATIC FLOPPY BRD	AF:	450-00474-00 REV B1
4150075	1	CAP CER .01UF .1" LD	C1	
4150140	3	CAP AX LDS 15UF	C19,20,21	
4150111	18	CAP .1UF	C2,3,5-7,9-11,13-18,22-25	
4150092	1	CAP MICA 220PF 10%	C4	
4150166	2	CAP TANT 10UF 10% TOL	C8,12	
4480047	1	ZENER 1N751	CR1	
4280007	18	AUGAT STAKE PINS	E1-8,14	
4210144	1	HEADER 10 PIN	E9-13	
4210229	1	HEADER 50 PIN RIGHT <	J1	
4470277	2	RES 680 OHM 1/8W	R1,2	
4470073	1	RES 1K OHM 1/4W	R3	
4470069	2	RES 680 OHM 1/4W	R4,12	
4470084	3	RES 3K OHM 1/4W	R5,6,11	
4470117	1	RES 68K OHM 1/4W	R7	
4470104	2	RES 20K OHM 1/4W	R8,10	
4470097	1	RES 10K OHM 1/4W	R9	
4313413	1	IC 74LS74	U1	
4313642	1	IC 74LS193	U10	
4313566	2	IC 74LS368	U11,12	
4313640	1	IC 74LS123	U13	
4313749	1	IC DM8131 6 BIT COMP	U15	
4313300	1	IC 74LS02	U16	
4313305	1	IC 74LS174	U17	
4313639	2	IC 74LS242	U18,24	
4313507	2	IC 74LS244	U19,23	
4313288	2	IC 74LS04	U2,5	
4313636	1	IC MK3883	U20	
4313508	3	IC 74LS245	U21,26,27	
4313420	1	IC FD1771	U25	
4313409	1	IC 74LS241	U28	
4313464	1	IC 74LS367	U29	
4313301	1	IC 74LS10	U3	
4313411	3	IC 74LS32	U4,14,22	
4313641	1	IC 74LS125	U6	
4313638	1	IC 74LS221	U7	
4313289	1	IC 74LS08	U8	
4313296	1	IC 74LS138	U9	
4470275	1	SIP 8 PIN 150 OHM	UR1	
4470276	1	SIP 8 PIN 10K	UR2	
4470179	1	SIP 8 PIN 1K	UR3	
4620019	2	SOCKET IC 40 PIN	X20,25	
4620100	1	SOCKET IC 20 PIN	X26	
4230018	1	CRYSTAL 4MHZ	Y1	
4210232	2	BUS BAR 3 SPACE	ZA	
4210233	3	BUS BAR 5 SPACE	ZB	
4280155	1	EJECTOR CARD EDGE	ZC	
'5025266	1	TRAVELER WIP	ZD NOTE IN HOUSE USE ONLY	

MD-STD-Z8Ø BUS PIN-OUT

COMPONENT SIDE		CIRCUIT SIDE	
PIN	MNEMONIC	PIN	MNEMONIC
1	+5V	2	+5V
3	GND	4	GND
5	-5V	6	-5V
7	D3	8	D7
9	D2	1Ø	D6
11	D1	12	D5
13	DØ	14	D4
15	A7	16	A15
17	A6	18	A14
19	A5	2Ø	A13
21	A4	22	A12
23	A3	24	A11
25	A2	26	A1Ø
27	A1	28	A9
29	AØ	3Ø	A8
31	/WR	32	/RD
33	/IORQ	34	/MEMRQ
35	/IOEXP	36	/MEMEX
37	/REFRESH	38	/MCSYNC
39	/STATUS 1	4Ø	/STATUS Ø
41	/BUSAK	42	/BUSRQ
43	/INTAK	44	/INTRQ
45	/WAITRQ	46	/NMIRQ
47	/SYSRESET	48	/PBRESET
49	/CLOCK	5Ø	/CNTRL
51	/PCO	52	PCI
53	AUX GND	54	AUX GND
55	+12V	56	-12V

For complete information on the Mostek Z8Ø-STD BUS see Publication number MK79646.

JUMPER AND SWITCH CONFIGURATIONS
MATRIX-80/SDT 48K
(MK78197)

SLOT NO.	BOARD	SUB ASSY. NO.	CONFIGURATION	
			JUMPER	SWITCH
1	MDX-CPU1	2035812	U5: 2-3 4-14 5-13 U10: 2-3 6-8 9-10 E7: 1-2 3-4	
2	MDX-DRAM16	2036117	B-C H-J	U28: 1-2 OFF 3-4 ON 5-6 ON 7-8 ON
3	MDX-DRAM32A	2036119	A-B D-E H-J	U28: 1-2 ON 3-4 ON 5-6 ON 7-8 ON
4	MDX-EPROM/UART	2036715	J4: 3-12	U8: 1-2 ON 3-4 OFF 5-6 OFF 7-8 OFF
5	MDX-PIO	2037015	J3: 1-2 5-6 9-10 11-12 J4: 5-6 9-10	
6	MDX-FLP	2047311	E2 E4 E5 E7 E8 E12 E13	

OFF=OPEN

JUMPER AND SWITCH CONFIGURATIONS

MATRIX-80/SDT 64K

(MK78206)

SLOT NO.	BOARD	SUB ASSY. NO.	CONFIGURATION	
			JUMPER	SWITCH
1	MDX-CPU1	2035813	U5: 4-14 5-13 U10: 2-3 6-8 9-10 E7: 1-2 3-4	
2	MDX-DRAM32A	2036118	A-B D-E H-J	U28: 1-2 OFF 3-4 ON 5-6 ON 7-8 ON
3	MDX-DRAM32A	2036119	A-B D-E H-J	U28: 1-2 ON 3-4 ON 5-6 ON 7-8 ON
4	MDX-EPROM/UART	2036715	J4: 3-12	U8: 1-2 ON 3-4 OFF 5-6 OFF 7-8 OFF
5	MDX-PIO	2037015	J3: 1-2 5-6 9-10 11-12 J4: 5-6 9-10	
6	MDX-FLP	2047311	E2 E4 E5 E7 E8 E12 E13	

OFF=OPEN

APPENDIX B

DISK DRIVE PREVENTIVE MAINTENANCE

DISK DRIVE PREVENTIVE MAINTENANCE

B.1 INTRODUCTION

The prime objective of any preventive maintenance activity is to provide maximum machine availabiliy to the user. Every preventive maintenance operation should assist in realizing this objective. Unless a preventive maintenance operation cuts machine downtime, it is unnecessary.

Visual inspection is the first step in every scheduled maintenance operation. Always look for corrosion, dirt, wear, binds, and loose connections. Noticing these items during PM may save downtime later.

Remember, do not do more than recommended preventive maintenance on equipment that is operating satisfactorily.

B.2 PREVENTIVE MAINTENANCE PROCEDURES

Details of preventive maintenance operations are listed in Figure B-1. During the normal preventive maintenance, perform only those operations listed on the chart for that preventive maintenance period. Observe all safety procedures.

B.3 CLEANLINESS

Cleanliness cannot be overemphasized in maintaining the disk drive. Do not lubricate the disk drive; oil will allow dust and dirt to accumulate. The read/write head should be cleaned only when signs of oxide build up are present.

FIGURE B-1 PREVENTIVE MAINTENANCE PROCEDURES

UNIT	FREQ MONTHS	OBSERVE	ACTION
Read/Write Head	12	Oxide build up	Clean Read/Write Head ONLY IF NECESSARY
R/W Head Load Button	12		Replace
Stepper Motor and Lead Screw	12 12	Inspect for nicks and burrs	Clean off all oil, dust, and dirt
Belt	12	Frayed or weakened areas	Replace
Base	12	Inspect for loose screws, connectors, and switches	Clean base
Read/Write Head	12	Check for proper alignment	

APPENDIX C

SPECIFICATIONS

C.1 ELECTRICAL SPECIFICATIONS

WORD SIZE

8 Bits Z80 Microprocessor

MEMORY CAPACITY

MK78197	MK78206
250K Bytes flexible disk formatted	250K Bytes flexible disk formatted
48K Bytes Dynamic RAM	64K Bytes Dynamic RAM
4K Bytes PROM firmware	4K Bytes PROM firmware

SYSTEM CLOCK

2.5MHz internal oscillator

BUS

Mostek STD-Z80 BUS (see page A-33)

POWER REQUIREMENTS (MAX)

MK78197 or MK78206	MK78210
110 VAC at 2 AMPS or	230 VAC at 1.5 AMPS
220 VAC at 1 AMP	

OPERATING TEMPERATURE RANGE

15 - 49° AMBIENT CELSIUS

INTERRUPTS

STD-Z80 BUS PRIORITIZED Interrupts

C.2 MECHANICAL SPECIFICATIONS

DIMENSIONS

HEIGHT: 8" (20.32 cm)
WIDTH : 21.1" (53.59 cm)
DEPTH : 20.7" (52.57 cm)

WEIGHT: 47 lbs (21.32 kg.)

APPENDIX D

PERIPHERAL INTERFACING INFORMATION

FIGURE D-1 MATRIX-80/SDT STANDARD CONFIGURATION

PERIPHERAL DEVICE	SOFTWARE MNEMONIC	FUNCTION
SERIAL ASCII TERMINAL	TT:	TERMINAL OUTPUT
	TK:	TERMINAL KEYBOARD

Uses Ports DCH, DDH, DEH, and DFH.
Uses connector J3 (rear panel)
Switch U8 on MDX-EPROM/UART must be set to user desired BAUD rate.

For peripheral cable detail, see Figure D-2 thru D-7.

FIGURE D-2 CABLE CONFIGURATION: SERIAL ASCII TERMINAL

MDX EPROM/UART SIGNAL	I/O CONNECTOR	ASCII TERMINAL	SIGNAL NAME
		RS-232-C/V.24	
CHASSIS GND	J3-1	EIA-1	AA
RECEIVE DATA	J3-2	EIA-2	BA
TRANSMIT DATA	J3-3	EIA-3	BB
REQUEST TO SEND	J3-4	EIA-4	CA
CLEAR TO SEND	J3-5	EIA-5	CB
DATA SET READY	J3-6	EIA-6	CC
GROUND	J3-7	EIA-7	AB
CARRIER DETECT	J3-8	EIA-8	CF
DATA TERMINAL READY	J3-20	EIA-20	CD
		20mA CURRENT LOOP	
RECEIVE (RX+)	J3-24	+ current loop input	
RECEIVE RET (RX-)	J3-12	- current loop input	
SEND (TX+)	J3-13	+ current loop output	
SEND RET (TX-)	J3-25	- current loop output	
READER STEP (RS+)	J3-16	+ current loop output	
READER STEP (RS-)	J3-21	- current loop output	

NOTE: Current loop pin-out is provided so that user may construct cable for specific application which requires current loop terminal.

The cable for the RS-232-C/V.24 interface is available from MOSTEK. Order part number MK78152.

The parts required to build the cable are listed below and are not available from Mostek.

25 pin 'D' Connector	ANSLEY #609-25P (2 required)
25 conductor cable	ANSLEY #171-26 (6' long)

FIGURE D-3 LINE PRINTER INTERFACE

PERIPHERAL DEVICE	SOFTWARE MNEMONIC	FUNCTION
CENTRONICS 3Ø6 or 7Ø2 TI81Ø with Centronics parallel interface	CP:	LINE PRINTER OUTPUT

Uses ports DØH, DlH, D2H, D3H
Uses I/O connector Jl (rear panel)

Install jumpers and ICs as follows on the MDX-PIO board.

Jumpers:

	J4-5 to J4-6	(E3)
	J4-9 to J4-1Ø	(E5)
	J3-1 to J3-2	(E6)
	J3-3 to J3-4	(E7)
	J3-5 to J3-6	(E8)
	J3-19 to J3-2Ø	(E15)
ICs:	U42 = 74LS42	
Remove:	J3-35 to J3-36	(E23)
	J3-23 to J3-24	(E17)

For peripheral cable detail, see Figure D-4.

FIGURE D-4 CABLE CONFIGURATION: CENTRONICS INTERFACE

MDX-PIO SIGNAL	I/O PANEL CONNECTOR (J1)	CENTRONICS CONNECTOR	CENTRONICS SIGNAL
AØ (19)	11	2	DATA 1
A1 (6)	1Ø	3	DATA 2
A2 (18)	9	4	DATA 3
A3 (5)	8	5	DATA 4
A4 (17)	21	6	DATA 5
A5 (4)	22	7	DATA 6
A6 (16)	23	8	DATA 7
A7 (3)	24	9	DATA 8
BØ (7)	6	1	/STROBE
B4 (9)	16	12	PAPER EMPTY
/BSTB (11)	2	1Ø	/ACK
GND (24) 14)	1	16	RETURN
GND (25) 15)	14	17	RETURN

Above cable is available from Mostek (MK79Ø89). The parts required to build the cable are listed below and are not available from Mostek.

25 pin 'D' connector - pin: AMPHENOL 17-2Ø25Ø (1 required)
25 pin 'D' hood: TRW/CINCH DB-51226-1 (1 required)
25 conductor cable: BELDEN 8459 (6' long)
36 pin connector - plug: AMPHENOL 57-3Ø336Ø (1 required)

FIGURE D-5 PPG-8/16 INTERFACE

PERIPHERAL DEVICE: PPG-8/16 PROM Programmer
SOFTWARE DRIVER NAME: PPG
PORTS USED: D4H, D5H, D6H, D7H
CONNECTOR USED: J2 REAR PANEL
PORT CONFIGURATION:

Install Jumpers and ICS as follows on the MDX-PIO board.

J3-9	to J3-10	(E10)
J3-11	to J3-12	(E11)
J3-25	to J3-26	(E18)
J3-33	to J3-34	(E22)
J4-5	to J4-6	(E3)
J4-9	to J4-10	(E5)

Remove: UR3, UR4

Refer to MDX-PIO manual for further information.

The MDX-PIO is shipped configured as above.

FIGURE D-6 PPG-8/16 CABLE

MDX-PIO SIGNAL	I/O PANEL CONNECTOR (J2)	PPG-8/16 CONNECTOR	PPG 8/16 SIGNAL
ARDY (1)	9	NC	NC
/ASTB (2)	1Ø	2	/ASTB
A7 (3)	8	2Ø	PA7
A5 (4)	6	16	PA5
A3 (5)	4	12	PA3
A1 (6)	2	18	PA1
BØ (7)	2Ø	26	PBØ
B2 (8)	11	3Ø	PB2 (PROG MODE)
B4 (9)	13	34	PB4 (PROG PULSE)
B6 (1Ø)	15	38	PB6 (CLK LATCH)
/BSTB (11)	17	24	/BSTB
BRDY (12)	24	NC	NC
GND (14)15)	22	13	GND
A6 (16)	7	18	PA6
A4 (17)	5	14	PA4
A2 (18)	3	1Ø	PA2
AØ (19)	1	6	PAØ
B1 (2Ø)	21	28	PB1
B3 (21)	12	32	PB3 (ENABLE)
B5 (22)	14	36	PB5 (PA OUT)
B7 (23)	16	4Ø	PB7
GND (24)25)	23	23	GND

FIGURE D-7 CABLE CONFIGURATION: FLOPPY DISC INTERFACE

MDX-FLP J2 CONNECTOR PIN #	I/O PANEL J9 CONNECTOR PIN #	FLOPPY DISC SIGNAL NAME		FLOPPY SYSTEM CONNECTED TO MATRIX-80/SDT
2*	26	LOW CURRENT INPUT		USER DEFINED
4	27	N/C		USER DEFINED
6	28	N/C		USER DEFINED
8	29	N/C		USER DEFINED
10	30	N/C		USER DEFINED
12*	31	DISC CHANGE		USER DEFINED
14	32	SIDE SELECT	($\overline{SS}$)	USER DEFINED
16**	33	IN USE		USER DEFINED
18	34	HOLD	($\overline{HLD}$)	USER DEFINED
20	35	INDEX	($\overline{INDEX}$)	USER DEFINED
22	36	READY	($\overline{RDY}$)	USER DEFINED
24	37	N/C		USER DEFINED
26	38	DRIVE SELECT 0	($\overline{DS1}$)	USER DEFINED
28	39	DRIVE SELECT 1	($\overline{DS2}$)	USER DEFINED
30	40	DRIVE SELECT 2	($\overline{DS3}$)	USER DEFINED
32	41	DRIVE SELECT 3	($\overline{DS4}$)	USER DEFINED
34	42	DIRECTION CONTROL	($\overline{DIRC}$)	USER DEFINED
36	43	STEP	($\overline{STEP}$)	USER DEFINED
38	44	WRITE DATA	($\overline{WD}$)	USER DEFINED
40	45	WRITE GATE	($\overline{WG}$)	USER DEFINED
42	46	TRACK 00	($\overline{TRACK\ 00}$)	USER DEFINED
44	47	WRITE PROTECT	($\overline{WTPT}$)	USER DEFINED
46	48	READ DATA	($\overline{RDDATA}$)	USER DEFINED
48*	49	SEPARATE DATA		USER DEFINED
50*	50	SEPARATE CLOCK		USER DEFINED

*These signals are not available at the MDX-FLP.BRD.

**Pin 14 and 16 are tied together on the MDX-FLP.BRD.

On the Floppy BRD, all odd pins are GND.

On the I/O Panel pins 1-25 are GND.

Logic levels are defined at the MDX-Floppy Edge Connector.

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PRINTED IN USA February 1981
Publication No. 79899

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